



OHS Responsibilities and Industry Supported Safe Work Practices

for the Automotive Mechanical Repair Industry



AUTOMOTIVE RETAILERS ASSOCIATION
Driving Industry Excellence

Table of contents

Part I	5
Purpose of This Document.....	7
Objectives	7
Scope	7
Legal Disclaimer.....	8
Copyright	8
Acknowledgements	8
Definitions.....	9
Information Resources	11
Part II	13
Injury Overview of the B.C. Auto Repair Classification Unit.....	15
Part III	17
Your Legal Responsibilities to Occupational Health and Safety.....	19
Meeting Due Diligence	20
Part IV	23
OHS Program Requirements	25
How to Use This Guidebook as a Teaching Resource	28
Incident Investigations.....	30
Part V	33
Risk Assessments.....	35
Hazard Controls	35
Identifying Hazards Through a Job Task Analysis	37
Part VI	39
Risk Matrix—An Approach to Ranking Hazards and Prioritizing Actions.....	41
Industry Specific Hazard Assessment Table.....	42
Part VII	47
Ergonomic Safe Work Practices	49
Part VIII	67
Safe Work Practices	69
Part IX	111
Appendices.....	113
Personal Protective Equipment.....	114
Training	117
Toolbox Meetings.....	118

Part I

This section includes information on the following:

- Purpose of This Document
- Objectives
- Scope
- Legal Disclaimer
- Copyright
- Acknowledgements
- Definitions
- Information Resources

Purpose of This Document

The purpose of this document is to:

- Provide information about workplace health and safety;
- Provide the automotive mechanical repair industry with safe work practices to eliminate or control hazards that can cause death, injury, or illness to automotive service technicians.

Objectives

Objectives for this document include:

- Increasing awareness of OHS responsibilities, worker rights and OHS program requirements;
- Advising on safe work practices to help employers eliminate and control hazards common to the automotive mechanical repair industry;
- Assisting employers and other workplace parties to comply with the requirements of the *Workers Compensation Act* (the *Act*), the *Occupational Health and Safety Regulation* (the *Regulation*) and other laws and statutes.

Scope

The scope of this document is specific to the automotive mechanical repair industry and includes information and safe work practices on the following topics:

- Legal Responsibilities to Health and Safety
- Meeting Due Diligence
- Occupational Health and Safety Program Requirements
- Risk Assessments
- Identifying Hazards
- Hierarchy of Safety Controls
- Job Task Analysis Exposure to Chemical and Biological Hazards
- Ergonomics
- Working Underneath a Vehicle, Hood, and inside a Cab
- Batteries
- Brake Pads and Asbestos
- Fluids and Hazardous Materials
- Office Safety
- Shop Safety
- Electric & Hybrid Safety
- Service Pits
- Tire Handling
- Tool and Equipment Safety
- Automotive Hoists
- Noise
- Vehicle Safety
- Violence, Harassment and Bullying

This document is intended to provide workplace parties in the automotive mechanical repair industry with information on their basic legal responsibilities and a consistent approach in identifying and safely controlling common workplace hazards. It is not intended to provide a “ready-made” health and safety program. While the hazards and controls described in this document may be common to many automotive mechanical repair facilities, employers—with input from their supervisors, workers, safety committee members or safety representatives—need to develop and implement an effective health and safety program that is specific to their operation.

Legal Disclaimer

The information presented in this document does not take the place of professional occupational health and safety advice and is not guaranteed to meet the requirements of applicable laws, regulations, and rules, including workplace health and safety laws and motor vehicle and traffic laws. The Automotive Retailers Association (ARA) and their respective employees, officers, directors, or agents assume no liability for, or responsibility for any loss or damage suffered or incurred by any person arising from or in any way connected with the use of or reliance upon the information contained in this document including, without limitation, any liability for loss or damage arising from the negligence or negligent misrepresentation of the ARA in any way connected with the information contained in this document. The information provided in this document is provided on an “as is” basis. The ARA does not guarantee, warrant, or make any representation as to the quality, accuracy, completeness, timeliness, appropriateness, or suitability of any of the information provided, and disclaims all statutory or other warranties, terms, or obligations of any kind arising from the use of or reliance upon the information provided, and assumes no obligation to update the information provided or advise on future developments concerning the topics mentioned.

Copyright

All rights reserved.

The information contained in this document is to be made available free of charge to all firms registered in the WorkSafeBC Auto Repair Classification Unit (CU) 764006. The ARA encourages the distribution of this document to promote health and safety in the workplace. However, no part of this publication may be copied, reproduced, or distributed for profit or other commercial enterprise, nor any part be incorporated into any other publication without the express written consent of the Automotive Retailers Association.

Acknowledgements

The ARA would like to thank the members of the mechanical repair division’s technical advisory committee (TAC) for their time and energy in helping to compose and assemble these industry-supported safe work practices into a single comprehensive document. The ARA would also like to thank WorkSafeBC for helping fund this initiative and for their advice and assistance in drafting the language of this document.

Definitions

OHS Definitions Used in This Document:

- **Classification Unit:** similar businesses share the same WorkSafeBC classification unit and pay the same base premium rate for their WorkSafeBC insurance.
- **Due Diligence:** due diligence requires that an employer identify all workplace hazards, implement all necessary preventive measures, and communicate appropriately to all necessary personnel.
- **Education:** generally refers to classroom instruction that may include lectures, discussions, and videos.
- **Employer:** a self-employed proprietor, partnership, corporation, society, or any other type of legal entity that hires workers or unregistered subcontractors.
- **Ergonomics:** a process that safely matches workplace conditions and job demands to a person's capabilities.
- **First Aid Requirements:** employers are responsible for providing workers with prompt, easily accessible, and appropriate first aid treatment.
- **Hazard:** a *hazard* means a thing or condition that may expose a worker to a risk of injury or occupational disease.
- **Hierarchy of Controls:** a listing of safety control measures in order of their effectiveness.
- **Incident:** a workplace occurrence which resulted in or has the potential to cause an injury or occupational disease.
- **Injury Rate:** the number of non-health care only claims per one hundred person-years of covered employment, where one hundred person-years is the equivalent of one hundred full-time and part-time employees working in the year.
- **Musculoskeletal Injury:** an injury which can affect muscles, tendons, ligaments, nerves, blood vessels, and joints of the neck, shoulders, arms, wrists, legs, and back. MSIs are a common type of workplace injury in all industries, accounting for about one-third of claims accepted by WorkSafeBC.
- **Near Miss Incident:** a work-related incident that has the potential for serious injury, death, or significant property damage.
- **OHS Guidelines:** information from WorkSafeBC to help with the interpretation of many sections of the *OHS Regulation* and sections of the *Workers Compensation Act* that relate to health and safety.
- **OHS Policies:** the official policies of WorkSafeBC that an organization must apply when making decisions.
- **OHS Program:** a health and safety requirement, the type of which depends on the size of the workforce and the nature and extent of the risks and hazards in the workplace.
- **Occupational Health and Safety Regulation (OHS Regulation):** a document that contains legal requirements for workplace health and safety that must be met by all workplace parties in B.C.
- **Order:** a WorkSafeBC directive to comply with the *Act* and or *OHS Regulation*.
- **Risk:** the chance or likelihood of injury or occupational disease.

- **Risk Assessment:** a health and safety process to ensure workers are protected while on the job. Specific risk assessment requirements are defined in different parts of the *OHS Regulation*.
- **Safe Work Practice:** a description of non-sequential activities to help workers safely perform a task.
- **Safe Work Procedure:** a written procedure lists a sequential process for safely performing a work-related task.
- **Standards:** certain sections of the *OHS Regulation* refer to standards developed by WorkSafeBC.
- **Supervisor:** a person who instructs, directs, and controls workers in the performance of their duties.
- **Time-Loss Claims:** the number of claims where the injuries occurred in a given year and were accepted for short-term disability, long-term disability, or survivor benefits in that year or in the first three months of the following year.
- **Training:** hands-on, job-specific instruction that may include demonstrations by workers so that supervisors can confirm that workers understand written safe work practices and procedures.
- **Traffic Control Devices:** includes cones, signs, barricades, flashing lights, flaggers, flashing arrow boards or any other item that warns drivers of a change in the road circumstance.
- **Violence:** attempted or actual physical force or any threatening statement or behaviour which gives a worker cause to believe they are at risk of injury.
- **WHMIS (1988 and 2015):** a system that provides information on hazardous products used in the workplace. Employers must use this information, as well as information specific to their workplaces, to educate and train workers to work safely with and near hazardous products.
- **Worker:** a person who is deemed to be a worker under the *Act*.
- **Workers Compensation Act:** a Statute to promote a culture of commitment on the part of employers and workers to a high standard of occupational health and safety. Part 3 of the *Act* addresses matters “such as the rights and responsibilities of workplace parties, joint committees, and worker representatives, protection against OHS-Related discrimination, incident reporting, investigations, enforcement, offences, administrative procedures, and regulation-making authority.” Some sections of the *Act* have associated policies and guidelines.
- **Workplace Health and Safety Policy:** a document that describes an employer’s commitment to protect the health and safety of workers and their commitment to the *OHS program*, among other details.
- **New and Young Worker:** *new worker* includes any worker who is new to the workplace, returning to a workplace where the hazards have changed, or relocated to a new workplace if the hazards in that workplace are different from the hazards in the worker’s previous workplace. *Young worker* means any worker less than 25 years of age.

Information Resources

Automotive Retailers Association (ARA)

The ARA represents the automotive industry in B.C. We're here to ensure the key issues and needs of our dynamic industry are being addressed so our members can focus on their own business growth and success. The ARA is the largest trade association of its kind in Canada, with over 1,000 business members across British Columbia. For more information visit www.ara.bc.ca.

www.WorkSafeBC.com

WorkSafeBC is an independent provincial statutory agency committed to safe and healthy workplaces and providing legislated compensation benefits to workers injured as a result of their employment. WorkSafeBC was born out of a compromise between B.C.'s workers and employers in 1917 where workers gave up the right to sue their employers or fellow workers for on-the-job injuries in return for a no-fault insurance program fully paid for by employers. For more information visit www.WorkSafeBC.com.

WorkSafeBC Prevention Information Line at 1-888-621-SAFE (7233)

The WorkSafeBC Prevention Information Line is available to answer questions about workplace health and safety, OHS responsibilities and to report a workplace incident. The Prevention Information Line accepts anonymous calls. To report after-hours and weekend incidents and emergencies, call 604 273-7711 in the Lower Mainland, or toll-free at 1 866 922-4357 (WCB-HELP) in British Columbia.

Employers' Advisers Office

Operating independently of WorkSafeBC, the Employers' Advisers office provides free advice, assistance, representation, and education to employers related to the workers' compensation system. For more information visit www.gov.bc.ca.

Workers' Advisers Office

Operating independently of WorkSafeBC, the Workers' Advisers Office provides free advice and assistance to workers and their dependants concerning WorkSafeBC decisions. For more information visit www.gov.bc.ca.

Health and Safety Associations

Health and Safety Association (HSAs) are organizations that serve the safety needs of stakeholders operating in a variety of B.C. industry sectors. Funded by employer levies, HSAs work to reduce the incidence of workplace injury, disease, and death in their respective industry sectors by promoting a strong workplace safety culture and providing services such health and safety education, training, and advice. In addition, many HSAs are "Certifying Partners" (CPs) for WorkSafeBC's Certificate of Recognition (Partners) Program, which encourages employers to create a voluntary OHS management system that goes beyond the current legal requirements.

Some examples of HSAs include the following:

- **SafetyDriven**
SafetyDriven™ represents the occupational health and safety needs of the general trucking and moving and storage CUs. For more information visit www.safetydriven.ca.
- **BC Construction Safety Alliance**
The BCCSA is a non-profit organization serving the construction, aggregate, and ready-mixed CUs. For more information visit www.bccsa.ca.
- **BC Fed Health and Safety Centre**
The centre provides health and safety education to joint committee members, workplace representatives, and other workplace parties. For more information visit www.healthandsafetybc.ca.

For a complete listing of B.C.-based HSAs and CPs visit www.WorkSafeBC.com.

Part II

This section includes information on the following:

- Injury Overview of the B.C. Auto Repair Classification Unit

Injury Overview of the B.C. Auto Repair Classification Unit

Overview

Just over 2,500 B.C. employers are registered in the Auto Repair Classification Unit (CU 764006). The majority of these firms have fewer than 20 workers. (Only 52 firms employ 20 or more workers.)

A typical year in B.C.'s transportation industry

Auto Repair is one of 36 classification units (CUs) in the WorkSafeBC Transportation and Related Services Subsector, which employs approximately 130,500 workers, or approximately 5.5 percent of the provincial workforce. Each year, transportation workers on average sustain just over 4,400 time-loss injuries. The average claim duration is 12 weeks, costing approximately \$25,100. The injury rate for the transportation subsector is twice the provincial average.

Safety Performance: How Does the Auto Repair CU Compare?

There are an average of 480 time-loss injuries in the Auto Repair CU each year. On average, these workers miss five weeks of work, with claim costs totaling \$18,816. This figure does not represent the true cost of the incident, which may be two to four times higher. With an injury rate of 3.4, approximately 1 in 27 workers in the Auto Repair CU will sustain a time-loss claim injury each year. This is more than 50 percent higher than the Transportation and Related Services Subsector, and three times higher than the provincial average.

Injury Statistics: 5-Year Average (2014 – 2018)

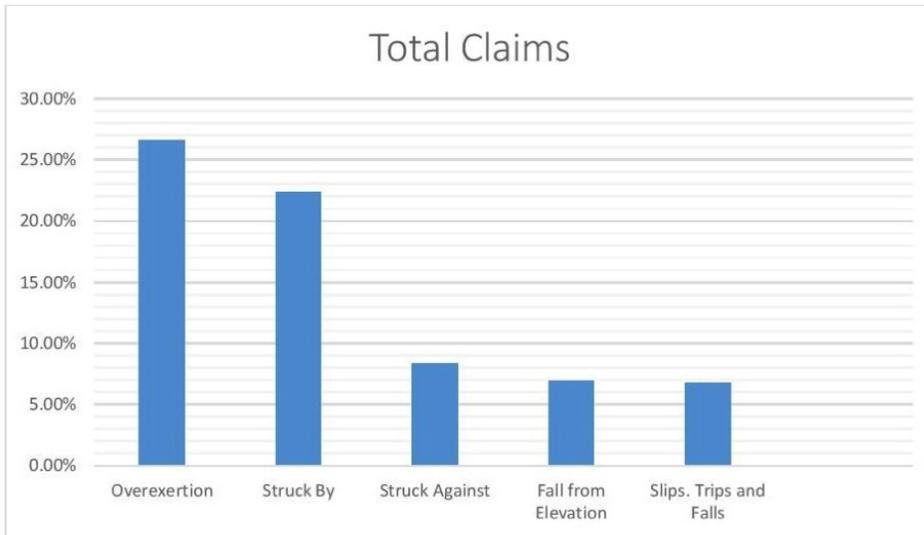
	Auto Repair CU	Transportation & Related Services Subsector (7320)	All BC Employers
Time-loss claims	447	4,484	49,604
Days lost	17,964	245,509	2.15 million
Total claim costs	\$9 million	\$100 million	\$862.4 million
Injury rate¹	3.5	4.5	2.2

¹ 2018 Injury Rate

Typical Workplace Incidents in Auto Repair

- Technician strained lower back when they were lifting a tire.
- Technician sustained shoulder injury when working underneath a vehicle.
- Technician sustained laceration when struck by a motor vehicle.

How Are Workers in Auto Repair Getting Hurt?



Who is Getting Hurt in the Industry?

- Automotive service technicians, truck and bus mechanics and mechanical repairers—**52.3 percent**
- Other automotive mechanical services—**22.4 percent**
- Other trades and helpers—**3.3 percent**
- Managers—**2.3 percent**

(Source: WorksafeBC)

Part III

This section includes information on the following:

- Your Legal Responsibilities to Occupational Health and Safety
- Meeting Due Diligence

Your Legal Responsibilities to Occupational Health and Safety

Employer Responsibilities

Employers have health and safety responsibilities under the *Workers Compensation Act* (the *Act*) and *Occupational Health and Safety Regulation* (*OHS Regulation*). These responsibilities include:

- Ensuring the health and safety of their workers and other workers present at the workplace.
- Establishing occupational health and safety policies and an OHS program.
- Providing general direction to management, supervisors, and workers about their responsibilities and roles in providing a safe and healthy workplace.
- Providing specific direction and delegate authority to those responsible for health and safety;
- Consulting and cooperating with individuals carrying out health and safety duties including joint committee members, OHS representatives, and WorkSafeBC prevention officers.
- Providing workers with information, instruction, training, and supervision necessary to protect their health and safety.
- Providing supervisors with the support for health and safety training.
- Providing and maintaining Personal Protective Equipment (PPE), devices, and clothing, and ensuring they are properly used.
- Ensuring adequate first aid.
- Conducting regular or special inspections and promptly reporting problems.
- Investigating incidents where workers are injured or equipment is damaged.
- Reporting all injuries to WorkSafeBC that required medical attention and submitting necessary forms.

Employers enable and set the tone for workplace safety. Strong leadership and commitment to improve health and safety, *backed by action*, is key to an effective safety program.

Supervisor Responsibilities

Supervisors have health and safety responsibilities under the *Act* and *OHS Regulation*. A supervisor provides instruction, direction, and controls workers in the performance of their duties. A supervisor can be any worker—an owner, management, or staff—who performs these duties, whether or not he or she has the title of supervisor. (Depending on the circumstance, a supervisor may also be a worker). Supervisor duties include:

- Ensuring the health and safety of all workers under their direct supervision.
- Ensuring that workers under their supervision are made aware of known or reasonably foreseeable health and safety hazards.
- Knowing and ensuring that applicable WorkSafeBC requirements are being followed.
- Consulting and cooperating with joint committee members or worker health and safety representatives, and co-operate with others carrying out occupational health and safety duties (including WorkSafeBC prevention officers).
- Ensuring that the appropriate PPE and clothing are available, properly inspected, maintained, and worn;
- Ensuring adequate first aid.
- Conducting regular or special inspections and promptly correcting to reported problems.

Supervisors play a critically important role in keeping workers safe and should give workplace health and safety the same priority as productivity.

Workers Responsibilities and Rights

Workers have responsibilities for their own health and safety and that of other workers. These include:

- Learning and following safe work practices and procedures.
- Being alert to hazards and immediately reporting hazards to their supervisor.
- Using the protective clothing, devices, and equipment provided.
- Performing work in a safe manner and not engaging in “horseplay” or working while impaired by alcohol, drugs, or other causes.

All workers have four basic health and safety rights:

- The right to know (orientation and training, all work-related hazards);
- The right to participate in OHS at the workplace;
- The right to refuse work that they have reason to believe would create an undue hazard; and,
- The right to no discrimination for refusing to do unsafe work.

For more information on the responsibilities of other workplace parties, visit www.WorkSafeBC.com.

Meeting Due Diligence

According to WorkSafeBC, due diligence *“requires taking all reasonable steps to protect workers from harm. ‘All reasonable steps’ is based on the level of judgment and care that a person would reasonably be expected to do under the circumstances. An organization that actively manages health and safety and takes all reasonable steps to protect workers from harm is being duly diligent.”*

The due diligence requirements of employers includes:

- Knowing and understanding their OHS responsibilities.
- Having a process to identify and control hazards.
- Committing the necessary resources to health and safety.
- Assigning safety responsibilities to workers and providing education, information and training.
- Keeping records, including training records and records related to OHS disciplinary action.
- Having a process to review your program, either annually, or following an incident or near-miss incident.

Documentation of an effective formal or informal OHS program is required to meet the test of due diligence. The documentation required to meet this test includes:

- The steps the employer took to control or eliminate specific hazards.
- Written safe work practices and procedures that are understood and followed by workers.
- Evidence of adequate instruction, training, and supervision.

If an OHS requirement has been violated, an employer must prove that they took all reasonable actions to ensure the health and safety of the worker or workers injured. WorkSafeBC will not impose monetary penalties or recommend prosecution if an employer was duly diligent. However, order may be issued by WorkSafeBC to correct the unsafe condition that led to the incident.

For more information on meeting due diligence, visit www.WorkSafeBC.com.

Part IV

This section includes information on the following:

- OHS Program Requirements
- How to Use This Guidebook as a Teaching Resource
- Incident Investigations

OHS Program Requirements

Employers are required to have an OHS program, the purpose of which is to:

- Eliminate or minimize the potential for work-related injuries, death and occupational disease;
- Identify and promptly control hazards;
- Support safe work behaviors;
- Deal effectively with any incidents;
- Ensure minimum compliance with WorkSafeBC requirements.

A “formal” OHS Program is required when there is a workforce of 20 or more workers, and at least one workplace at which there is a moderate or high risk of injury or a workforce of 50 or more workers. Elements of a formal OHS program include the following:

- A written safety policy;
- Supervision;
- Written safe work practices or procedures;
- Workplace inspections;
- Effective orientation, training, and education of workers;
- Joint OHS committee (or a worker OHS representative in firms with more than nine but fewer than 20 regularly employed workers);
- First aid provisions (requirements are listed in the *OHS Regulation*);
- Management meetings that focus on safety;
- Investigations that meet minimum compliance requirements;
- Maintenance of OHS records and statistics.

A business with a smaller workforce requires an “informal” OHS program. An informal program includes, *at minimum*:

- Effective orientation, training, education and supervision of workers;
- Regular inspections and corrective actions;
- Monthly meetings with workers that focus on correcting unsafe conditions and practices;
- Making and retaining written OHS records;
- First aid provisions (requirements are listed in the *OHS Regulation*);
- Incident investigations that meet minimum compliance requirements.

A WorkSafeBC prevention officer may require some smaller workplaces to update their program from an informal program to a formal program (see below) in situations when there is:

- High-risk work and/or a high number of injury claims;
- Serious injuries or fatalities;
- Repeat non-compliance with the *Act* and *OHS Regulation*.

Written Safety Policy

An important part of a safety program is a health and safety policy that is specific to your workplace. An effective OHS policy is a signed statement of an employer's commitment to workplace health and safety and includes language describing:

- The employer's commitment to protect workers;
- Policy goals and objectives (eg. preventing injuries, complying with the Act and OHS Regulations); and,
- OHS responsibilities and worker rights.

All workers should be made aware of policy and its importance. The policy should be reviewed annually, or following a workplace incident.

For more information on developing an OHS policy visit www.WorksafeBC.com or www.ara.bc.ca/about-education-training/ara-health-safety.

Supervision

Supervision activities include:

- Ensuring workers are properly trained and observing safety actions and behaviors after training.
- Making informal inspections to ensure practices and procedures are being followed.
- Enforcing safety rules, practices, and procedures.
- Conducting informal discussions (crew talks) to discuss specific safety issues.

Written Practices and Procedures

A written safe work practice provides general guidance about a work-related task. A written safe work procedure is different from a practice in that it provides step-by-step instructions to guide workers when initiating and completing a specific work process. The OHS Regulations requires written safe work procedures for a number of activities, including:

- Fall protection;
- Personal protective equipment;
- Violence in the workplace;
- Emergency evacuation;
- Chemical spills clean-up; and,
- Working alone or in isolation.

Depending on the workplace, other safe work procedures or practices may be required:

- Electronic device/hands-free policy;
- Vehicle use policy; and,
- Practices discussed in this document, where applicable.

Workplace Inspections

A thorough workplace inspection helps workplace parties identify and document all of the potential hazards that may harm your workers and subcontractors. Inspections may be scheduled on a daily, weekly, or monthly basis depending on the types of hazards and other requirements (eg. manufacturer's instructions or compliance requirements set out in the *OHS Regulation*).

General inspection categories include:

- Regular inspections (e.g. the workplace, equipment, and work methods that might cause injury);
- Equipment inspections (e.g. vehicles, tools, and equipment); and,
- Special inspections (required after an incident or malfunction).

When conducting an inspection, consider the following criteria:

- Hazards;
- Non-routine operations, maintenance, or changes in schedules;
- Previous first aid incidents, time-loss incidents, and near misses; and,
- Injury information provided by WorkSafeBC, the ARA, and health and safety associations.

When conducting your inspections, consult and involve your supervisors, workers and subcontractors, joint safety committee member, or safety representative. Promptly respond to any workplace health and safety issues brought to your attention.

Orientation, Education, and Training

Employers are required to provide a health and safety orientation to a young or new worker before they begin their work duties. Information that must be addressed and documented during the orientation and training includes the following:

- Supervisor's name and contact information;
- The employer's responsibilities to safety under the *Act* and *OHS Regulations*;
- The young or new worker's OHS rights and responsibilities;
- Workplace OHS practices and/or procedures (eg. working alone, violence in the workplace, emergency situations, and PPE);
- Workplace hazards and how to report unsafe conditions;
- Location of first aid facilities and how to request first aid;
- Instruction and demonstration of the work task or work process;
- WHMIS information, where applicable; and,
- Contact information for the health and safety committee or safety representative.

For more information on young and new worker orientations, visit: www.ara.bc.ca/about-education-training/ara-health-safety.

Employers must ensure that every worker receives instruction on how to work safely. This is usually done through a combination of education and training.

Education generally refers to classroom instruction that can include lectures, discussions, videos, or online tutorials. Training generally refers to hands-on, job-specific instructions provided individually or in small groups to workers. Following training sessions, workers should be able to demonstrate to their supervisors that they can perform wspecific tasks safely.

How to Use This Guidebook as a Teaching Resource

OHS Regulation Part 3 Division 3—General Duties of Employers, Workers and Others Sec 115 (2) (e) states every employer must: “provide to the employer’s workers the information, instruction, training and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other workers at the workplace.” The materials contained in this guidebook help serve as a tool for instructing workers in good safe work practices. This section will offer strategies for helping implement and maintain a robust health and safety program for your workplace.

Organize the Information

The best place to start in setting up a training program for your employees is to select relevant content then organize into manageable parts. This will mean that at a minimum you should hold regular safety meetings to go through and discuss with your staff the relevant topics you have chosen.

It is important not to overwhelm your employees by trying to cover everything all in one meeting. Instead, choose a relevant topic from a list, or discuss a recent incident and what everyone can do to help rectify the situation and ensure that proper control measures are established to reduce the likelihood of that incident from occurring again.

Toolbox Meetings

A toolbox meeting is an informal safety meeting, which is generally conducted at the job site prior to the commencement of a job or work shift. Job supervisors can draw attention to hazards, processes, equipment, tools, environment and materials to inform all workers of the risks in their surroundings.

Meetings should be regular and consistent (daily, weekly, etc.) and should last no longer than 5–10 minutes. Below are some best practices for a successful toolbox meeting:

1. Choose a relevant topic: a most recent hazard, concern or incident that is relevant to your workplace.
2. Use this guidebook and resources to learn what others are doing.
3. Understand and explain why this is important and why this topic has been chosen.
4. Prepare notes about what you want to discuss.
5. Use real-life examples to help demonstrate your point.
6. Remind your employees about best practices and employer and employee responsibilities.
7. Invite questions and feedback and be prepared to answer questions.
8. Keep records of all toolbox meetings, including the topic covered, who attended, and action items or takeaways.
9. Follow-up with workers to ensure that safe work practices and procedures are being adhered to.

Demonstration and Participation

Use of visual aids can greatly enhance your ability to convey relevant information to your employees. Supply copies of this guidebook or prepared notes to your employees so they can review the materials discussed. Use of pictures and videos can also help the employee visualize the process.

People generally learn best, however, when they are actually involved in the learning process. Wherever possible, offer a visual demonstration to emphasize safe work practices or under supervision have the worker go through the procedure modelling safe work practices and procedures.

Training New & Young Workers

Adults and young workers often learn in different ways. Understanding this will allow you to be flexible in meeting their needs. Training for young and new workers will have to be customized and delivered in a manner that matches their learning styles. Vary your method for delivering the information; this will help keep things interesting.

Joint Occupational Health and Safety (OHS) Committee

A joint OHS committee—comprised of worker and employer representatives—meets monthly to identify any health and safety problems. The legal duties of the joint committee include:

- Identifying unsafe situations and making written recommendations to the employer.
- Promptly responding to health and safety issues.
- Consulting on issues related to occupational health and safety, including changes to work processes.
- Participating in inspections, investigations, and inquiries.
- Reporting on the effectiveness of the committee.

Note: for smaller operations, the worker safety representative has similar duties to that of a Joint OHS committee.

For more information on workplace inspections or joint OHS committees, visit www.WorkSafeBC.com.

First Aid Provisions

Employers are responsible for determining and providing a minimum level of first aid in the workplace. This information is set out in the *OHS Regulation Schedule 3-A: Minimum Levels of First Aid*.

Management Meetings

A formal OHS program requires management to meet periodically to review health and safety activities, incidents, and trends. Such meetings can be used to:

- Review existing policies and procedures.
- Review feedback from workers.
- Consider reports and information or written recommendations provided by the joint OHS committee.
- Address questions or concerns brought directly to management.
- Review reports and industry OHS information.

Incident Investigations

The purpose of an incident investigation is to:

- Identify the cause or causes of workplace incidents and near misses.
- Prevent similar events from reoccurring.
- Compliance with WorkSafeBC requirements.

Employers are responsible for investigating certain incidents or near-misses that take place in the workplace:

- Incidents that result in injury to a worker requiring medical treatment;
- Incidents in which a worker is injured or killed;
- Incidents in which no one is hurt but equipment or property is damaged; and,
- “Near-misses”: incidents that could have resulted in a serious injury, death, or property damage in similar circumstances.

It is recommended that incident investigations be carried out by persons knowledgeable about the work. An incident investigation must involve:

- A worker representative;
- An employer representative; and,
- Safety representative or members of the joint OHS committee.

Employers are responsible for completing up to four separate incident reports—each representing the investigation’s status at a specific point in the process. These report types include:

1. Preliminary investigation;
2. Interim corrective actions;
3. Full investigation; and,
4. Final corrective actions.

1. Preliminary investigation

Employers must complete a preliminary investigation and produce a report within 48 hours of an incident.

2. Interim corrective actions

Between an incident and the conclusion of the full investigation, an employer must take all actions necessary to prevent a repeat of the incident. Interim, documented corrective actions during this period may include a full or partial shutdown of the worksite, removal of equipment, or reassignment of workers to other duties.

3. Full investigation

A full written investigation—which must be completed within 30 days of the incident—identifies the underlying factors that led to the incident (eg. what factors made the unsafe condition possible?)

4. Final corrective actions

Once the full investigation has been completed, an employer must prepare a final corrective action report that describes:

- The unsafe conditions that led to the incident.
- What corrective action is necessary.
- The steps the organization will take to implement those actions.

Note: the aforementioned incident investigation reports must contain the information required by WorkSafeBC Prevention Policies D10-175-1 and D10-176-1. For information on these requirements, visit www.WorkSafeBC.com.

When to Notify WorkSafeBC

Employers must immediately notify WorkSafeBC of any serious incidents that:

- Resulted in serious injury to a worker or the death of a worker.
- Involved a major structural failure or collapse of a crane or hoist, or major release of a hazardous substance.

Following an incident or near miss, a WorkSafeBC investigation may be conducted. Findings from WorkSafeBC investigation reports are posted online and are intended to help employers and workers understand the underlying factors that contributed to workplace incidents so similar incidents can be prevented. In addition, the investigation process will determine if enforcement action, such as imposing an administrative penalty or proceeding to prosecution, is appropriate.

For more information on incident investigations, visit www.WorkSafeBC.com.

Records and Statistics

Required OHS program records may include:

- Inspection reports and records of corrective actions taken.
- Preliminary investigation, interim corrective actions, full investigation, and final corrective action reports.
- Worker orientation and training records for workers and training records for supervisors.
- Records of safety meetings and crew talks.
- Joint committee meeting reports showing steps taken to address health and safety issues.
- Equipment logbooks and maintenance records.
- First aid records.

For larger employers, injury statistics (such as near misses, first aid only, health care only, and time-loss injury) may be useful for identifying trends and for measuring the effectiveness of the OHS program.

Part V

This section includes information on the following:

- Risk Assessments
- Hazard Controls
- Identifying Hazards Through a Job Task Analysis

Risk Assessments

Employers need to identify the specific hazards that exist at their workplace (or workplaces) and how these hazards may put their workers at risk. A risk assessment is a process to help determine:

- **Who** may be harmed by specific workplace hazards?
- **How** they may be harmed?
- **What** control measures are required to eliminate or control the harm?

Specific risk assessment requirements are defined in the *OHS Regulation*. A number of required processes are forms of risk assessment, such as workplace inspections and incident investigations discussed previously.

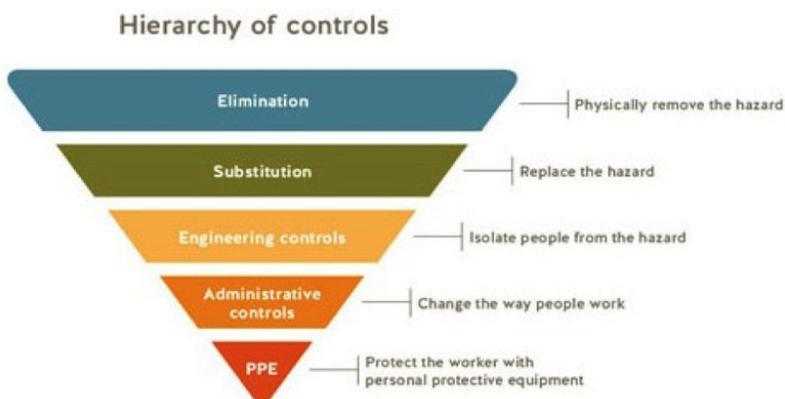
In most situations, for employers who operate small businesses, the organization should conduct a risk assessment with input and participation from their workers. Risk assessments should be reviewed whenever new equipment, materials, or work processes are introduced, or following a near-miss incident or injury. At minimum, employers must update the assessment annually.

When conducting your risk assessment, consider the following:

- Workers and their different job functions;
- New and young workers, temporary workers, workers who work alone, contractors, maintenance workers;
- The kinds of injury or illness which could be suffered;
- Possible injury severity; and,
- The length of time exposed to the hazard.

Hazard Controls

As discussed in the “OHS Responsibilities” section of this document, employers must take steps to ensure the safety of their workers and other workers present at the worksite. Employers must eliminate (where possible) or minimize workplace hazards. To do this, it is recommended that employers follow the health and safety “hierarchy of controls.” The hierarchy lists safety controls in order of their effectiveness:



Elimination

Identifying ways to completely eliminate a workplace hazard is the most effective way to ensure worker safety.

Substitution

If eliminating a workplace hazard is not possible, then substitution—which involves replacing the material or process with a less hazardous one—should be considered next.

Engineering Controls

In the event that you cannot eliminate the hazards or substitute a safer approach, you should consider the effectiveness of implementing an “engineering control.” Engineering control may include lifting devices or hoists, guarding for where crush injuries may occur, barriers (which can include the placement of vehicles to reduce the likelihood a worker is struck near incidents), and other control measures.

Administrative Controls

Administrative (or process) controls typically involve the development and implementation of effective safe work practices and/or procedures. Examples of administrative controls include implementing working alone procedures and prohibiting the use of handheld electronic devices when behind the wheel.

Personal Protective Equipment (PPE)

The use of PPE, such as a suitable high-visibility vest, protective eyewear, and suitable gloves can help to reduce exposure risk.

When developing or strengthening your controls, all five types of controls should be evaluated. A combination of controls—such as engineering and administrative controls—may be effective in reducing risks.

Finally, employers need to monitor the effectiveness of their hazard controls measures. This involves:

- Conducting regular safety inspections to evaluate if the controls are effective, or if new hazards have been created.
- Responding to issues in a timely manner.
- Organizing monthly meetings to discuss and address workplace hazards.
- Keeping a record of your activities.

It is recommended that you involve your supervisors, workers, safety representative, or joint OHS committee member when identifying and implementing hazard controls.

Identifying Hazards Through a Job Task Analysis

A job task analysis (also known as a job hazard analysis) is a process to help identify hazards that exist within each job and select the appropriate safety control measure (or combination of measures) to eliminate, where possible, or minimize the risk to workers.

When conducting a job hazard analysis consider the following process:

- Break each job down by duties and tasks.
- Identify, assess, and catalogue hazards and the risks they pose to the worker.
- Determine if a control measure (or measures) can eliminate the hazard; if the control measure or measures can't eliminate the hazard, develop a safe work practice or step-by-step safe work procedure.
- Provide education, information, training, and supervision to workers.
- Provide effective supervision.

Part VI

This section includes information on the following:

- Risk Matrix—An Approach to Ranking Hazards and Prioritizing Actions
- Industry Specific Hazard Assessment Table

Risk Matrix

An Approach to Ranking Hazards and Prioritizing Actions

Risk, as defined by WorkSafeBC, means the chance or likelihood of injury or occupational disease occurring. Risk is evaluated based on the likelihood of occurrence. Risk factors are found by multiplying the **Likelihood** by the **Consequences** to equal the final **Risk Rank**:

$$\text{Likelihood} \times \text{Consequences} = \text{Risk Rank}$$

Hazard identification and risk assessment is taking a known hazard—like traffic—and evaluating the likelihood of that hazard occurring. Known hazards are analyzed for their level of risk using the following risk matrix to assign a number called the **Risk Rank**. Hazards can then be prioritized based on their risk rating.

1. **High-risk** activities must be addressed immediately and reviewed often to ensure control measures are accurate and adequate.
2. **Moderate-risk** activities are addressed once all the high risk activities have adequate control measures in place.
3. **Low-risk** activities are then reviewed and control measures put in place to address them.

Risk Matrix	Consequences	Low Impact	Serious	Catastrophic
Likelihood	Ranking	1	2	3
Remote	1	1	2	3
Possible	2	2	4	6
Probable	3	3	6	9

- 1-3 = Low Risk
- 4 = Moderate Risk
- 6-9 = High Risk

This matrix is an industry supported method for assessing risks developed in consultation with the ARA's Automotive Mechanical Repair Technical Advisory Committee. The following table details common hazards and their associated risk ranking based on likelihood of occurrence and degree of consequences. The table references safe work guidelines in order to reduce the likelihood of a hazard occurring. You may use the table as quick reference chart.

Industry Specific Hazard Assessment Table

Industry Specific Hazard Assessment						
Factor	Likelihood	Consequences	Hazards	Recommended Controls	Rank	Risk Level
Tire Handling	2	2	Awkward postures Rotating parts Dust Exposure to noise Falling vehicles	Proper training Effective supervision Tire lift Ergonomic assessment and corrective measures Safe work procedures Suitable PPE (safety glasses, gloves and footwear)	4	Moderate 
Working Under Vehicles, Hood, and Inside Cabs	2	2	Poor lighting Awkward postures Hot engine parts Bending, stretching and reaching movements	Ergonomic controls Safe work procedures Mechanical assistance Adequate lighting	4	Moderate 
Batteries	1	3	Electric shock Gases Fire and explosion Acid Injury to hands and arms	Proper training (i.e. WHMIS) Effective supervision Ventilated work area Ergonomic assessment and corrective measures Use appropriate hand tools in good condition Use a battery carrier or follow proper lifting practices PPE (suitable safety glasses, gloves and footwear)	3	Low 

Factor	Likelihood	Consequences	Hazards	Recommended Controls	Rank	Risk Level
Brake Pads & Asbestos	2	2	Exposure to asbestos Rotating parts Dust	Substitution Exposure control plan Inventory and identification of materials Proper training Effective supervision Designated work area Safe work procedures (i.e. HEPA vacuum system) PPE and protective clothing	4	Moderate 
Fluids & Hazardous Substances	2	3	Uncontrolled release of pressure Fire & explosion Burns Asphyxiation & fumes	Risk assessment and corrective measures Proper training (i.e. WHMIS) Effective supervision Ventilated work area and control of ignition sources Appropriate labeling, storage and handling Suitable PPE (safety glasses, gloves and footwear) Emergency washing stations	6	High 
Office Safety	2	1	Slips, trips & falls Obstructed walkways Slippery floors	Proper training Effective supervision Safe physical environment Suitable lighting Good housekeeping	3	Low 
Shop Work Area	2	2	Fall from height Awkward postures Manual lifting Lowering & raising materials Being struck by falling objects Forklift injury	Proper training Effective supervision Safe physical environment (e.g. lighting, housekeeping, storage) Safe work procedures	4	Moderate 

Factor	Likelihood	Consequences	Hazards	Recommended Controls	Rank	Risk Level
Electric & Hybrid Vehicles	3	3	Corrosion Lifting battery Electro shock	Proper training Effective supervision Safe work procedures (e.g. following manufacturer's instructions)	9	High 
Service Pits	2	3	Falls from height Poor ventilation Asphyxiation Fire & explosion	Proper training Effective supervision Guard rails Ventilation Fire risk controls Safe work procedures	6	High 
Tool & Equipment Safety	2	2	Failure of lifting equipment Rolling vehicles Burns Electric shock Poor lighting Poor ventilation Vibration	Proper training Effective supervision Equipment selection Inspection and maintenance Safe work procedures Proper storage	4	Moderate 
Automotive Hoists	2	2	Crush injuries or fatalities Rolling vehicles	Proper training Effective supervision ANSI requirements Regular inspections Safe work procedures (e.g. following manufacturer's instructions)	4	Moderate 
Noise Exposure	2	2	Load sudden noises Loss of hearing Increased blood pressure & heart rate Distraction and disruption	Proper training Effective supervision Noise measurement Hearing conservation program Engineered noise controls PPE	4	Moderate 

Factor	Likelihood	Consequences	Hazards	Recommended Controls	Rank	Risk Level
Vehicle Driver Safety	3	2	Moving vehicles Pedestrians Poor weather/ roadside conditions Vehicle falling off jack	Proper training Effective supervision Risk assessment Safe work procedures (motor vehicles and mobile equipment)	6	Moderate 
Worker Well-Being	2	2	Well-being Stress & fatigue Violence, bullying and harassment Poor performance Increased risk of injury	Proper training Effective supervision Risk assessment Work design (to reduce ergonomic risks and manage fatigue risk) Suitable first aid Enforced workplace policies (bullying and harrassment)	4	Moderate 

Part VII

This section includes information on the following:

- Ergonomic Safe Work Practices

Ergonomic Safe Work Practices

Introduction

Musculoskeletal injuries (MSI) are soft tissue injuries, such as strains or sprains, that may result from a single incident (traumatic injury) or that may develop gradually over time (degenerative disorders). The BC Occupational Health and Safety (BC OHS) Regulation includes a legislated duty to manage the risk of MSI, with guidance in the Ergonomic (MSI) Requirements of sections 4.46 to 4.53.

MSI are defined in the BC *OHS Regulation* (Section 4.46) as: “an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissues including a sprain, strain and inflammation, that may be caused or aggravated by work”.

Generic MSI Hazards

Requirements for identifying MSI hazards and assessing risk are outlined in BC *OHS Regulation* sections 4.47 to 4.49, with related requirements for consultation in section 4.53. In practice, there are generic MSI hazards that may be considered in any work situation when attempting to identify MSI hazards. The key MSI hazards include the risk factors described below.

Force

Lifting, pushing, pulling, carrying, holding, gripping, torqueing, or rapid motions that require muscular effort increase stress on tissue.

Muscle effort depends on the type of grip that is used. Whole hand grip (power grip) allows the use of larger muscles and provides greater strength; therefore, higher forces can be applied with less effort. Finger or finger tip grip (pinch or pulp grip) uses smaller muscles that have less strength; therefore, smaller forces require more effort.

Muscle effort depends on how far the load is from the body. Lifting, pushing, pulling, carrying requires greater muscle effort when the load is further from the body or when awkward postures are also involved.



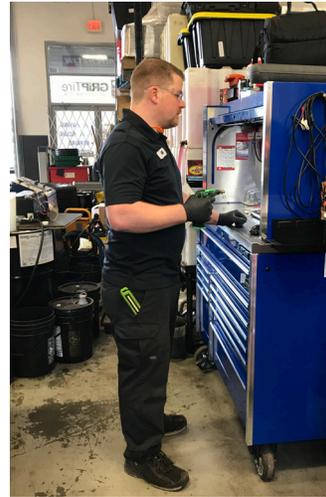
For example, lifting tires or other heavy parts.

Awkward postures

Reaching, bending, or twisting of any joint in the body increases stress on tissue (joints, tendons, muscles, ligaments) and reduces the ability of muscles to generate force. Risk increases as the posture of any joint moves closer to the end range of normal movement and further from neutral posture.

Neutral posture is generally a position of the greatest strength and minimal effort. Standing with feet, hips, shoulders, and eyes aligned in the same direction; elbows at 90 degrees and hands in hand-shake position is a neutral posture position of strength.

Awkward postures include upward reach when working under a vehicle on a hoist:



or bending to work near ground level or under the hood.



Repetition

Making the same movements or efforts over and over. Higher rate of movement or efforts per minute (force and/or awkward posture) increase fatigue and increase risk associated with forceful effort or awkward posture.

For example, use of a wrench to loosen and tighten bolts or tire lugs:



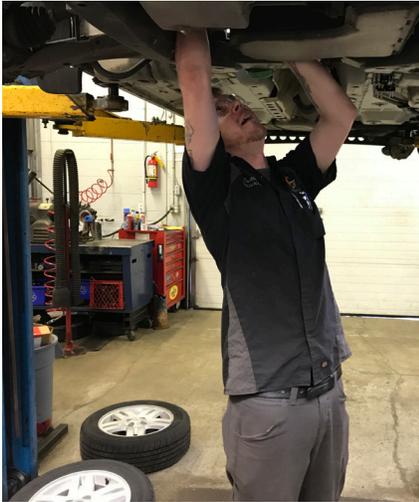
Sustained force or posture

Holding an awkward posture and/or forceful effort without the ability to return to a resting condition (neutral posture, no force) increases fatigue and increases risk associated with forceful effort or awkward posture.

The longer the duration of sustaining force or awkward posture, the greater the risk.

The shorter the duration of rest between consecutive sustained forceful efforts or awkward postures, the greater the risk.

For example, holding arms above head and looking up when working beneath a vehicle on a hoist:



Vibration

Powered or pneumatic hand tools like grinders, drills or pneumatic wrenches transfer repetitive forces from tool operation directly to the hand and arm. Vibration may come directly from the tool or it may be the result of the tool interacting with the piece of work (for example, the motor of a grinder produces vibration and the grinding wheel spinning across a surface produces vibration).

Stronger vibration and longer duration of vibrating tool use (both during a shift and years of work) increase the risk.

Forceful grip or force applied to a vibrating tool (for example, pressing hard on a grinder) increases the amount of vibration transferred to the hand and arm.

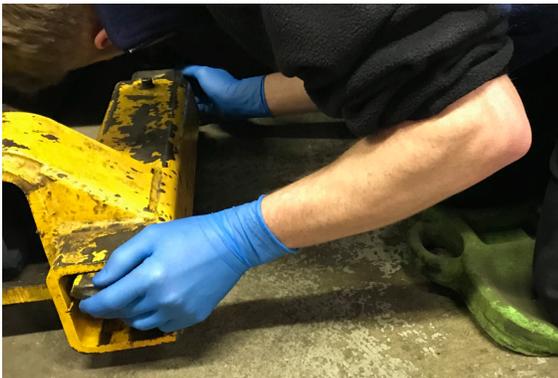
Awkward wrist posture while operating a vibrating tool increases risk to the wrist and forearm.



Adjust hoist height to align tires with elbow height when removing or installing tires and when using a pneumatic wrench to loosen or tighten tire lugs.

Contact pressure

Leaning on or gripping objects that have small ridges, bumps or sharp edges increases risk by blocking blood flow, nerve function, and movement of tendons or muscles.



The smaller the edge and the greater the force applied at that edge, the greater the risk.

Unaccustomed work

New employees who are not yet used to the work that they are asked to perform or experienced employees who perform work that they do not usually perform are at higher risk than employees are used to performing the work.

Employees who are used to performing specific work benefit from a training effect that results in physically stronger muscles that are used to perform the work and will often have a more efficient, effective work technique that can reduce the strain on tissues.

Risk Severity and Multiple Risk Factors

Risk of MSI increases with the severity of individual hazards, the duration of exposure to the hazard, and when multiple risk factors occur at the same time. For example, risk is higher for a specific level of force when that force is applied while in an awkward posture and is sustained for a long period without rest.

Generic MSI Controls

Requirements for controlling MSI risk are outlined in BC *OHS Regulation* sections 4.50 and 4.51, with related requirements for consultation in section 4.53. In practice, there are generic approaches to controlling MSI risk that can be considered in any work situation to identify appropriate solutions. The key MSI risk control strategies include the following.

Elimination—make risk disappear

Remove the activity or risk factor from the work. This means either the activity is no longer performed (we don't do that task anymore) or the activity is automated in a manner that significantly changes how the work is done. For example, the use of a hoist or jib to lift a heavy component eliminates the need for workers to lift; or the use of a bulk dispensing system eliminates the need to manually handle smaller containers of the same material.

Engineering—the best equipment and setup

The physical equipment and space are selected and configured to minimize the amount of force, awkward postures, rate of repetition, duration of sustained work, or vibration. This typically involves care to set up working heights, the use of lift assists or carts, and the selection of quality tools or assistive devices that are appropriate for the work. For example, using wheeled carts to position parts and tools within easy reach rather than placing items on the ground; or the use of a step to elevate the worker when working above waist level; or providing powered hand tools that are light, ergonomic handled, and low vibration but effective.

Administrative—the best behaviour and technique

Influence behaviour to minimize risk through training, work technique, pace control, opportunity for breaks, and policy or procedures. For example, manual lifting technique when handling tires. Awareness training on risk factors for MSI, early symptom recognition, and control strategies that workers can implement in their daily work is also an administrative control.

Personal Protective Equipment—the best barriers for physical or chemical hazards

When hazards remain after engineering and administrative controls have been put in place, PPE can provide a barrier to protect the worker. PPE must be appropriate for the work, the hazard, and must fit the individual worker. For example, the use of a foam pad when leaning across sharp edges or against hard surfaces; or the selection of gloves to fit the worker's hands and the work being performed.

Interim Controls

When there will be a delay in putting a planned control strategy in place, there should be a short-term plan to control the hazard during the delay.

Common Issues and Control Ideas to Minimize MSI Risk

Tire Handling

Removing, replacing and services tires can involve high forces and awkward postures that are repeated several times for each vehicle. Reduce the risk by using the equipment that is available and good body mechanics when handling tires.



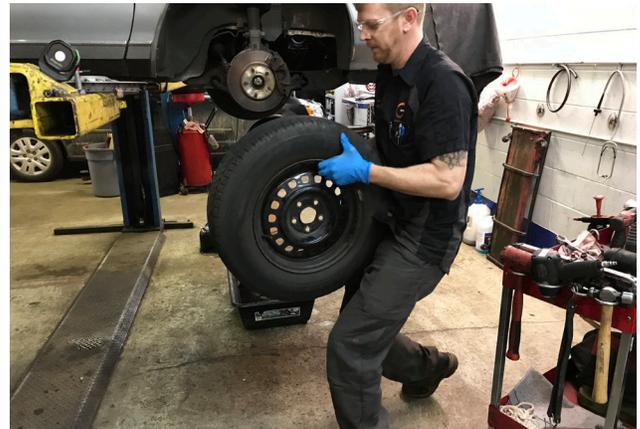
Tire lifters eliminate the need to lift tires.



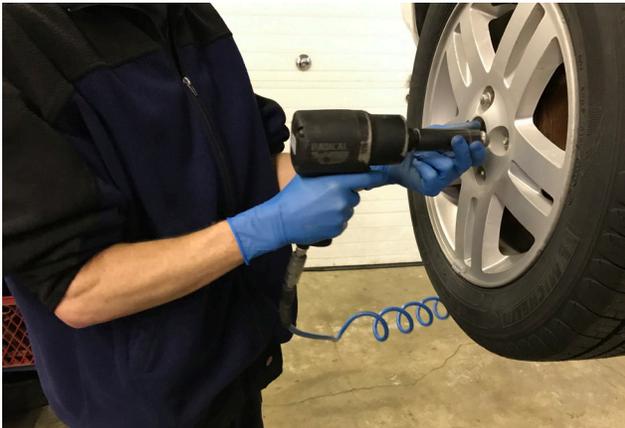
Roll tires into place and let the machine do the heavy lifting.



When lifting smaller tires, technique matters.



Roll the tire up a leg rather than bending to lift from floor level.



Adjust hoist height to align tires with elbow height when removing or installing tires.



Preferred technique for torquing tire nuts—stagger feet and bend at the knees; push pelvis backward to protect the low back; align handle of torque wrench directly below shoulder to use upper body weight for downward force on the torque wrench; push only as hard as needed to meet torque requirements.

If using a hoist that supports the tires, adjust hoist height to position the tire lugs at waist height to eliminate the need to bend downward.



Hand Tools

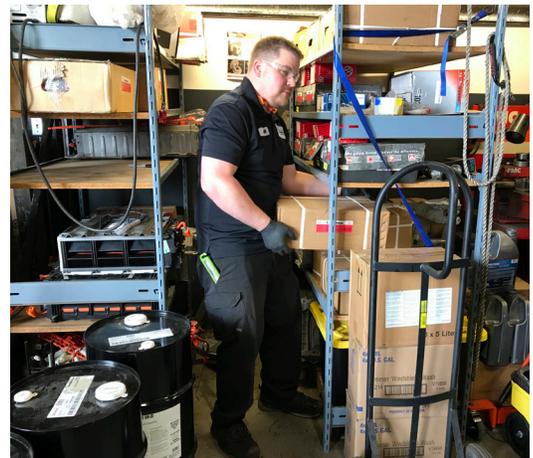
The use of hand tools (powered or manual) often require force, awkward postures of the wrist, repetitive motions and vibration. Poorly designed tool grips may also present contact pressure. Reduce risk by selecting quality tools that suit the work and fit the hand, and by taking the opportunity to position the work or the person to support tool use while adopting neutral postures.

Stock Handling and Storage (Parts, Fluids)

Anything that is put into storage or on a shelf will need to be lifted to put it there and lifted again to remove it for use. The height and location of storage influences the postures required when lifting and the risk associated with stock handling. Reduce risk by using lift assists for heavy items, selecting appropriate storage locations based on size and weight of the item, and by using good body mechanics when lifting.



Store large or heavy items that will be moved using a dolly or hand truck at floor level to eliminate the need to lift. Tilt into place and use the dolly or hand truck to do the lifting.



Store heavier items that will be manually lifted between mid-thigh and mid-chest level to prevent awkward postures when lifting.



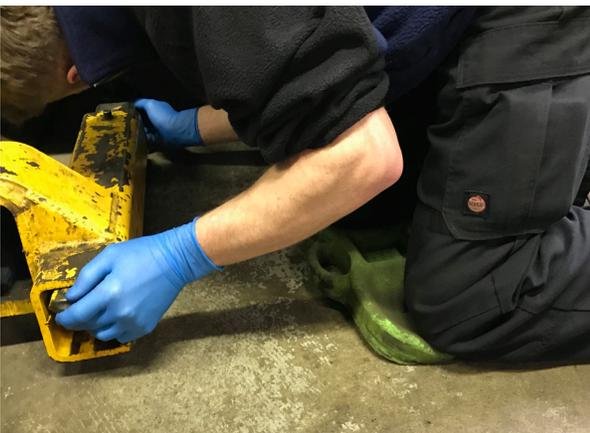
Store smaller, lighter items between chest and head height.



Consider the use of bulk dispensers with lines to each service bay for fluids rather than using smaller containers that require lifting, carrying and pouring.

Overhead Work

Overhead work with the vehicle on a hoist requires sustained or repeated awkward postures to work above head level and may involve awkward postures with kneeling and contact pressure to set the hoist beneath the vehicle. Reduce risk by using the available equipment to improve postures and to reduce the duration of awkward postures, offload stretching and changes in position to provide recovery, and kneeling pads to eliminate contact pressure.



Use foam kneeling pads when setting the lift beneath a vehicle at ground level.



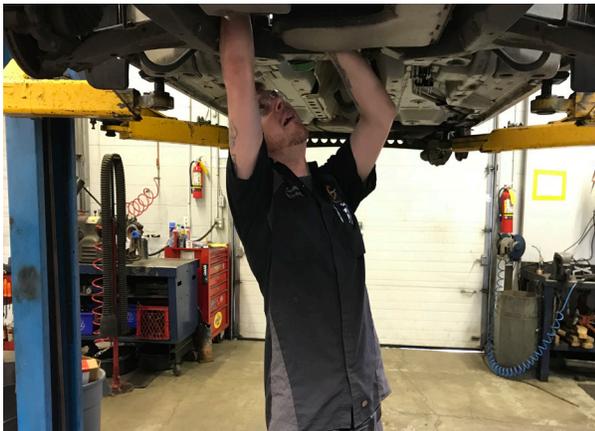
Keep the kneeling pads at the lift so they are always readily available.



Adjust hoist height to provide minimal head clearance.



If working in a designated bay, mark the hoist to make the initial height adjustment easier.



"Offload stretch". Provide recovery from working overhead by periodically moving in the opposite direction.



Look down and stretch arms backward.



Stabilize or hold parts using screw jacks rather than manually. This keeps both hands free and reduces the amount of time with hands above head.



The use of a wheeled stool or chair can provide some rest from prolonged standing. Set the hoist height for seated height.



Standardize a location to place tires when working overhead to minimize tripping hazard. The technician will be looking up. Ground-level items present risk of tripping.



Position task lighting to ensure clear view of the area being worked on. Rechargeable magnetic LED lights maintain position, can be targeted to where the light is needed and have no cords to trip on.

Under Hood Work

Under hood work involves sustained awkward postures to reach into the engine compartment and may involve contact pressure when leaning on or across edges. Reduce risk by adjusting the height of the vehicle or the technician, providing a padded surface to lean against, and offload stretching to provide postural recovery.



Topside creepers provide a way to elevate the technician and a padded surface to lean on.



Kneeling pads or even discarded foam seat pads can provide a soft surface to lean against, eliminating contact pressure and supporting some of the upper body weight when leaning forward.

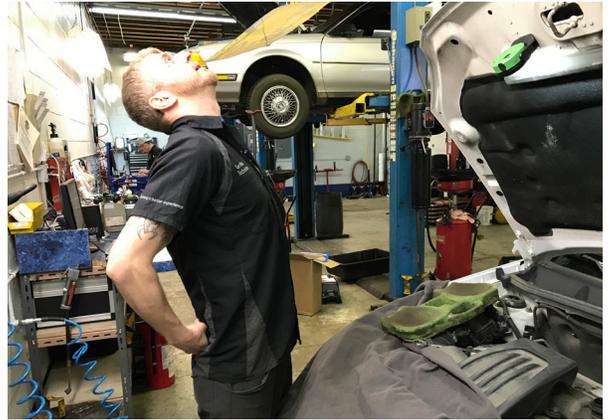


Steps with a large standing surface improve shoulder postures when working on taller vehicles.





“Offload stretch”. Provide recovery from leaning forward by periodically moving in the opposite direction.



Look up and push pelvis forward.

In Cab Work

In cab work often requires awkward postures due to the limited space to position the body within the vehicle, the location of items beneath the dash, and poor lighting or dark zones.

Improve postures by taking the time to set up the work to allow more neutral postures, more space and more light.

Reduce risk by adjusting the seat position and hoist height to improve working postures and visual access to the components being serviced. Use a task light to improve visual access to items beneath the dash—light up the work area in dark zones.



Use a hoist that allows the doors to fully open and position the height of the vehicle to provide good visual access when working beneath the dash.



Adjust seat position backward to provide as much space as possible and to improve access within the cab. Use a task light to provide clear visual access to items in dark locations below the dash.

Under Vehicle (Ground Level) Work

Work at ground level beneath the vehicle requires awkward postures and limited space for movement. Reduce risk by avoiding ground level work when possible. Use the vehicle hoist. Keep the work area clean and use creepers for easier access when ground level work is required.



Keep the floor clean and free of oil, fluids and small parts to support easy and safe movement at floor level, and to enable casters to roll when moving a creeper.



Use a creeper with a padded head rest and casters that move easily.

Heavy Part Handling

Heavy parts (e.g., engine, transmission, differential, electric vehicle battery banks) are often heavier than safe to manually lift, even with more than one person. Reduce risk by using supportive jigs or a powered assist such as a scissor lift, forklift, portable jib crane or overhead crane.



Scissor lifts can raise or lower heavy parts to a comfortable working height or to a position that assists with installation. The combined use of a scissor lift to support heavy parts and a vehicle hoist to raise or lower a vehicle onto or off the part can reduce heavy lifting. Wheeled scissor lifts are also useful for moving heavy parts into position.



A forklift can be useful for moving heavy parts, vehicles, bulk fluid containers or shipments of supplies into position.



Screw jacks or other lift assists can be used to position and hold heavy parts when working beneath the hoist.



Use jigs to support heavy parts during removal or installation.

Unplanned Events

Items that fall or that are dropped present risk from rapid, forceful movements when attempting to catch a falling item or from the item landing on the technician. Reduce risk by eliminating the possibility of the item dropping and by training technicians to step clear of falling items rather than attempting to catch them.



Step clear and let falling items fall. Clean up is faster than injury rehabilitation.



Prevent dropped tools. Before raising a vehicle on the hoist, ensure that all tools and loose parts are removed from the engine compartment. After raising the hoist, anything that drops lands on the technician. Tips to prevent dropped tools: Place any loose parts and tools within the engine compartment on a rag or tray to make them easier to see. Better yet, place loose parts and tools on a cart or tool tray beside the vehicle.

General Work Environment

Keep the floor clean and free of oil, fluids, water, cords, parts, tools or anything that may present a slip or trip hazard.



Provide high level ambient lighting and task lighting to ensure that both work and hazards are visible.



Ambient lighting from above and from the side helps to prevent shadows, improves working postures and reduces the likelihood of slips and trips.



Magnetic, rechargeable LED lights are useful to illuminate when working below the vehicle or in dark areas and require no cords that may present a tripping hazard.



Provide supportive equipment at every bay to ensure that it is easily accessed when needed. This may include carts, tool trays, kneeling pads, leaning pads, lift assists (e.g., screw jack), steps or creepers.

Part VIII

This section includes information on the following:

- Safe Work Practices

Safe Work Practices

● Tire Handling

Employer Responsibilities for Handling/Changing/Repairing Tires Include:

- Conducting a risk assessment that identifies the hazards that workers may be exposed to during tire handling.
- Implementing control measures to minimize the risk to workers.
- Informing, educating, training, and supervising workers.
- Ensuring workers are trained in the safe work procedures for servicing tires, rims and wheels.
- Ensuring all equipment is suitably maintained and fit for purpose.

Worker Responsibilities for Handling/Changing/Repairing Tires Include:

- Learning and following safe work procedures for servicing tires, rims and wheels.
- Being alert to hazards and immediately reporting hazards to their supervisor.
- Performing work in a safe manner, personally and for others around them.

Common Hazards Include:

- MSI injuries.
- Exploding tires.
- Unsecured vehicles (falling from hoist or jack stands).
- Struck by object.

Workers must follow written safe work procedures when handling, changing, or repairing tires. These procedures may include the following actions:

Loading/Unloading Tires

- Follow safe ergonomic practices (discussed in section VII) when loading/unloading tires.
- Where available, use mechanical aids to move tires. If necessary, safely lift and only carry one tire at a time; do not roll tires.
- When loading and/or unloading tires from a vehicle do not throw the tires off.
- Use appropriate loading/unloading procedure:
 - a) Bend at the knees, grasp the tire with two hands, elevate the tire to upright position and carry the tire to the end of the truck or hand off the tire to co-worker.
 - b) Do not stack tires above shoulder level without assistance.
 - c) When unstacking tires that are above shoulder height use two people to unstack down to shoulder height.

Procedures for Tire Changing Without a Hoist

1. Familiarize yourself with the equipment required to change the tire and for proper storage of tools required (jack, tires, wrenches). Ask your supervisor if you are uncertain.
2. Conduct a pre-shift inspect of tools.
3. Wear suitable PPE (i.e. safety eyewear).
4. Where possible park vehicle away from passing traffic on solid, level ground surface area and easily visible at a distance from oncoming traffic/hazards. Always wear suitable high visibility garments, and use of traffic cones when necessary.
5. Stop the engine; turn on the emergency flashers.
6. Put the transmission in "P" Park (automatic) or "R" Reverse (manual), and set the parking brake.
7. Exit the vehicle, have everyone get out of the vehicle and stay in a safe place, away from traffic and away from the vehicle.
8. Use wheel chocks to keep the vehicle from rolling prior to jacking up the vehicle.
9. Always use good body mechanics when lifting and/or securing a wheel (see Ergonomics Tire Handling).
10. Always ensure a safe and effective grip on tools.
11. Position the jack on a level and solid place and at the correct jack point, as designated by the instruction manual for the vehicle. As the vehicle begins to lift, double check that the jack is properly positioned and place a jack stand for support.
12. Once the jack stand is in position release the jack until the vehicle is supported by the jack stand.
13. Only go under a vehicle when a suitable jack stand is in place.
14. Know and follow manufacturer's instructions; only service tires on split rim-type unless trained.
15. Ensure vehicle is properly secured and de-energized.
16. Ensure work space is free of tripping hazards.
17. Inspect condition of tire, wheel and lugs. Discard damaged parts.

Procedures for Changing a Flat-Tire/Spare

1. Once the lug nuts or wheel bolts are removed lift the flat tire straight off the hub (see Ergonomics Tire Handling). Note: if exceeding a safe handling weight use appropriate wheel handling equipment. Place it a safe distance away from your work area.
2. Before putting on a wheel, remove any corrosion on the mounting surfaces with a wire brush or cloth.
3. Roll the spare wheel into position and align the holes in the rim with the hub.
4. Lift up the wheel and secure with the top bolt/stud started through its hole.
5. Wiggle the wheel and push it back over the hub.
6. Reinstall the lug (wheel) nuts/bolts and torque to manufacturer specifications.
7. Lower the vehicle safely to the ground (if using a jack remove jack stands).
8. If equipped with a hubcap (wheel ornament) position and then tap it firmly with a rubber mallet to snap it into place.

Tire Machines

- Conduct a pre-shift inspect of tire machine.
- Wear suitable PPE (i.e. safety eyewear).
- Keep hands clear of all pinch points when using machines.
- Never exceed factory recommendations for tire inflation.
- Never attempt to mount a defective tire.
- Always ensure tire size matches rim size.
- Inspect wheel rim for defects (e.g. fractures, cracks or bent).
- Never mount a tire on a defective wheel rim.
- Remove or restrain any clothing, hair, or jewelry that could become entangled in the machine.
- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized.
- Ensure work space is arranged to allow the safe movement of people, equipment and materials. Ensure free of tripping hazards.
- Conduct a pre-shift inspect of tire machine.
- Inspect condition of tire, wheel and lugs. Never attempt to mount a defective tire or use a defective rim. Discard damaged parts.
- Ensure tire size matches rim size.
- Keep hands away from pinch points. Remove or restrain any clothing, hair or jewelry that can become entangled.
- Support tire with lifting equipment before attaching the tire to the wheel hub.
- Mount the tire fully before inflating.
- Make sure all rim components are properly in place and secured before inflating.
- Use air hose according to manufacturer's instructions.
- Use a gauge to correct tire pressure.
- Work in a properly ventilated work space when using cleaning or repair materials; following manufacturer's instructions and use suitable PPE.

Inflating/Deflating Tires

- With multi-piece rims always deflate the tire before loosening the wheel nuts or bolts.
- When inflating multi-piece rim and tire assemblies always use a suitable restraining device such as a safety cage, safety T-bar or safety chains. This is also considered safe work practice for single rim tire and assemblies.
- Keep out the trajectory when handling or inflating tires.
- Inflate tires to the recommended pressure using a clam-on air chuck and an in-line valve and gauge.
- The hose should be long enough to allow the worker to keep out of the trajectory.
- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized.
- Ensure work space is arranged to allow the safe movement of people, equipment and materials. Ensure free of tripping hazards.

- Inspect condition of tire, wheel and lugs. Never attempt to mount a defective tire or use a defective rim. Discard damaged parts.

● Working Underneath a Vehicle, Hood, and Inside Cab

Employer Responsibilities Include:

- Employers are responsible for ensuring there are written safe work procedures in place when working underneath a vehicle.
- Ensure that only adequately trained workers operate tools and equipment.
- Educate, train, and supervise workers on safe work procedures.

Worker Responsibilities Include:

- Learn and follow safe work practices and procedures.
- Wear appropriate personal protective equipment.
- Perform work in a safe manner.

Common Hazards Include:

- Poor lighting, cramped working conditions, awkward or sustained postures, hot and unguarded engine parts and hazardous substances (e.g. fuels, fluids).
- Working inside the confined and awkward spaces within vehicle cabins.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized.
- Ensure work space is free of tripping hazards.
- Wear suitable PPE (i.e. safety eyewear).
- Conduct a pre-shift inspection of equipment.
- Always use proper equipment before working or when lifting a vehicle and ensure all lifting points for jacks and stands are correct for that vehicle.
- Use only jacks that are maintained in good condition.
- Use stands on a hard level surface (e.g. concrete) and avoid lifting on sloped ground.
- Securely chock any wheels remaining on the ground.
- Never exceed the rated capacity (safe working load) of any lifting equipment or jack.
- Ensure that vehicles are properly supported.
- Always inspect jack stand before use.
- Properly position and secure the jack stand before lifting.
- Never lift vehicle or equipment higher than is required. If working with or assisting a fellow worker always ensure proper communication is established.
- Never leave a suspended vehicle on a jack stand unattended.

Vehicle Jacks

- Place the jack securely on a dry, level, clean surface at right angles to the load.
- Position the jack at the jack point recommended by the vehicle manufacturer.
- Shift the vehicle with automatic transmission into park or low gear if it is a standard transmission.
- Use wheel chocks in front and back of the vehicle on the diagonal of the side of the vehicle that is being raised (e.g. if jacking up the right front of the vehicle use chocks in the left, rear wheel).
- Never overload a jack beyond its rated capacity.
- Do not position yourself where you could be pinned between the operating handle and the wall in case the vehicle or jack moves suddenly.
- If working alone, have someone check on you at pre-arranged regular intervals.
- Place safety stands under the vehicle if you will be working under the vehicle. Never get underneath a vehicle that is supported by a jack only.
- Ensure the safety stands are in good condition and positioned properly.
- Always wear appropriate personal protective equipment including safety glasses when working underneath a vehicle.

Vehicle Ramps & Stands

- Conduct pre-operational inspections daily.
- Ensure axle stands are based on a solid, level and secure surface (preferably concrete).
- Secure vehicles on ramps to prevent movement (e.g. use of handbrake, wheel chocks etc).
- Do not adjust stand heights when they are bearing weight.
- Mark ramps and stands with rated safe working load.
- Only use ramps and stands in pairs.
- Slowly drive vehicles onto ramps or stands with guidance from another person outside the vehicle.
- A spotter must not stand directly in front of or behind the wheel. The spotter and driver should maintain line of sight eye contact throughout the procedure.

Working Underneath Vehicles

- Conduct a pre-shift inspection of tools and work space.
- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized.
- Ensure work space is arranged to allow the safe movement of people, equipment and materials. Ensure work space is free of tripping hazards.
- Make sure that all lifting points for jacks and stands are correct. Use stands on a level concrete surface.
- Remain within the rated capacity (safe working load) of all equipment.
- Wear suitable PPE (i.e. safety eyewear).
- Use the correct pins for axle stands—screwdrivers, nails, and bolts are not acceptable.
- Ensure that vehicles are always properly supported—do not rely on a jack or jacks.
- Use suitable portable lighting.

- Whenever possible improve the worker's access to vehicle (e.g. use of creepers).
- Whenever possible, improve support for the worker (e.g. use a chair with head support that can be tilted).
- Whenever possible, change the vehicle working angle and height by using a lifting device (e.g. ramps or side supports) to improve access to the work area.
- Whenever possible, provide powered tools (e.g. air operated) that reduce the time spent applying force while working at the limits of reach.
- Support the tools as well as the worker so that muscle effort is reduced.
- Reduce the need to hold or support parts being removed (e.g. use dollies, slings etc.).
- Reduce task length for above-shoulder work (e.g. remove entire units that can then be worked on at a bench).
- Provide differing height vehicle hoists or platforms for workers to stand on, and use in-ground pits.
- Ensure there is adequate lighting (e.g. lead lights).
- Provide personal protective equipment (PPE) that is appropriate for the nature of the work (e.g. eye and hand protection), of suitable size and ensure that it is maintained in good condition.

Working in Engine Compartment

- Conduct a pre-shift inspection of tools and work space.
- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized (e.g. disconnect battery and discharge any capacitors).
- Ensure work space is arranged to allow the safe movement of people, equipment and materials. Ensure free of tripping hazards.
- Secure the trunk and hood when working underneath them.
- Inspect a running engine with extreme caution.
- Only work or effect repairs on a cool engine and exhaust system.
- Remove rings, metal watches, and bracelets before working on any engine.
- Keep hands away from moving parts. Use extreme caution working around engine fans.
- Avoid touching or coming into physical contact with hot engine parts.
- Never run an engine in an enclosed, indoor space. Always guard against potential carbon monoxide poisoning.
- Use caution when working with electrical components.
- Protect hearing from excess engine or shop noise (see Noise Exposure).
- Keep tools accessible and within safe reaching distance.
- After repair make sure area is safe before starting.

Working Underneath the Hood

- Conduct a pre-shift inspection of tools and work space.
- Know and follow manufacturer's instructions, including vehicle's owner's manual.
- Ensure vehicle is properly secured and de-energized.

- Ensure work space is arranged to allow the safe movement of people, equipment and materials. Ensure work space is free of tripping hazards.

Adopt good working positions (see Ergonomics Under Hood Work).

- Use approved height platforms to stand on for better access.
- Raise vehicles to approximately waist height to remove the need to bend as far forward.
- When lifting batteries or other heavy objects from the engine compartment of a vehicle, use the following procedures:
 - a) Press your thighs against fender by leaning into vehicle.
 - b) Grasp the object by lifting with both hands.
 - c) Keep the object close to body, with elbows close to body.
 - d) Turn body using feet, not twisting at waist.
 - e) Move the object to a work bench and lower onto bench. Use arms to lower and do not bend.
- Ensure postures are not held for long durations through job rotation, using mirrors to reduce time exploring the engine, and using purpose-built jigs.
- Provide protective pads to allow for resting of the upper torso on vehicles being worked on (also prevents paintwork or panel damage).
- Use overhead-mounted body support harnesses to reduce back strain.
- Use powered tools (e.g. air operated tools) that reduce the time spent applying force while working at the limits of reach.
- If necessary remove the hood to reduce awkward work positions.
- Provide a stable step to give access to the engine bays of taller vehicles.
- Use a hoist to give access from underneath, if this improves the working position.
- Reduce the weight before handling (e.g. drain fluids before lifting).
- Ensure there is adequate lighting.

Working Inside Cabins

- If possible, remove components (e.g. seats) or other items to improve access.
- Raise vehicles on a hoist to enable easier access under the dash from a standing position.
- Change the vehicle working angle and height by using a lifting device (e.g. hoist) to improve access to the work area.
- If practical, when examining under the dash, use inspection mirrors. Do not twist your body or maintain an awkward posture when trying to look under the dash (see Ergonomics in Cab Work).
- Use a spacer or filler (e.g. beanbag or foam equivalent if it improves the working position).
- Support the tools and the worker, so that muscle effort goes into using, not holding tools.
- Use powered tools (e.g. air operated) as possible to reduce time spent working in constrained, awkward postures.
- Use braces to support the load (e.g. when undoing dashes).
- Use vacuum lifters to hold and position windscreens.
- Ensure there is adequate lighting.

Batteries

Employer Responsibilities Include:

- Conduct a risk assessment—including an ergonomic assessment and suitable control measures to ensure worker safety.
- Use a battery carrier or follow proper lifting practices.
- Provide proper information, education and training (i.e. WHMIS)
- Effective supervision.
- Provide appropriately ventilated work area.
- Use appropriate tools in good condition.
- PPE (suitable safety glasses, gloves and footwear).
- Inform workers how they may be exposed to hazardous materials.
- Provide personal protective equipment.
- Implement control measures to minimize the risk to workers.

Worker Responsibilities Include:

- Learn and follow safe work practices and procedures.
- Wear appropriate personal protective equipment.

Common Hazards Include:

- Release of gases when charging batteries.
- Acid coming into contact with skin.
- Strains and back injury.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Always use personal protective equipment when handling batteries.
- Keep tools and other metallic objects away from batteries.
- Inspect for defective cables, loose connections, corrosion, cracked cases or covers, or loose terminal posts.
- Clean terminals of both batteries so positive and negative markings can be clearly seen.
- Use proper tools when changing battery.
- Use proper lifting procedures when removing or replacing a battery.
- Use a battery carrier to lift a battery or position hands at opposite corners.
- Gases released when batteries are charging can result in explosion. Keep sparks, flames, or other ignition sources away from batteries at all times.
- When connecting or disconnecting jumper cables use extreme care when handling the clamps.
- Do not allow cables to touch each other or touch the frame or body of the vehicle.
- Do not leave batteries laying around the shop floor. Always store in proper containment.
- Batteries contain sulphuric acid. Always wear personal protective equipment to avoid contact with acid.

- If splashed with battery acid flush the area gently with lukewarm water.
- In the event of a spill neutralize with battery acid neutralizer immediately.
- Never leave a battery charger unattended overnight.
- To charge a battery, connect the leads first then turn the charger on.
- Stop charging the battery if it gets too hot.
- When you disconnect the battery ensure you have proper eye protection.

● Brake Pads (Asbestos)

Auto mechanics who perform brake and clutch repairs risk exposure to brake and clutch dust that may contain asbestos fibres. Once suspended in the air, asbestos fibres can be inhaled. Prolonged exposure to asbestos dust can cause chronic lung disease or even lung cancer. After exposure to asbestos fibres you may not feel any immediate effects. The diagnosis of cancers such as mesothelioma can occur 10 to 40 years after exposure. Vehicles produced in Canada or the US don't have asbestos in the brakes when new, but may be fitted with aftermarket brake pads. A federal ban on asbestos products is in effect as of 2018 but they may still be around for many years.

Employer Responsibilities Include:

- Risk assessment—including an ergonomic assessment and suitable control measures to ensure worker safety.
- Compliant WHMIS program.
- Suitable containers and storage.
- Ensure workers have necessary information, instruction, training and supervision, specifically, the elements of a WHMIS program:
 - Major hazards and hazardous products at the workplace.
 - Rights and responsibilities of employers and workers.
 - Content of labels and safety data sheets.
- When employers are not sure if the products contain asbestos, they must implement control measures to protect workers.
- Ensure the health and safety of their workers when it comes to asbestos exposure or any other hazard. This includes informing workers of hazards they may face and making sure workers are aware of their rights and duties.
- Always provide a place to wash hands and face.
- Develop and enforce safe work procedures to minimize generating airborne dust, and eliminate the generation of airborne dust that contains asbestos.
- Ensure that workers exposed to dust from friction materials wear personal protective equipment (at a minimum this would include a half mask with a dual cartridge HEPA filter).

Worker Responsibilities when working on brakes Include:

- Workers have the right to refuse unsafe work.
- If workers are concerned that a work process may be exposing them to asbestos, they must stop the work immediately and report the concern to a supervisor. The supervisor must ensure any unsafe condition is remedied without delay.
- Always follow written safe work procedures.
- Follow procedures for safe use, handling, storage and disposal of product used.

Common Hazards Include:

- Long term exposure to changing brake pads containing asbestos.
- A worker was using compressed air to clear debris off a trailer's brake shoes. The airborne dust that resulted drew the attention of other workers. A lab analysis confirmed that the brake material contained 20 to 30 percent chrysotile asbestos, which is the most common form of asbestos.
- Every employer must ensure the health and safety of their workers when it comes to asbestos exposure or any other hazard. This includes informing workers of hazards they may face and making sure workers are aware of their rights and duties.
- Employers must provide workers with the information, instruction, training and supervision necessary to ensure their health and safety.
- Always provide a place to wash hands and face.
- Develop and enforce safe work procedures to minimize generating airborne dust, and eliminate the generation of airborne dust that contains asbestos.
- Ensure that workers exposed to dust from friction materials wear personal protective equipment (at a minimum this would include a half mask with a dual cartridge HEPA filter).

Workers who perform brake and clutch installations and repairs risk exposure to dust that may contain asbestos fibres and must follow written safe work procedures. These may include the following:

- When ordering aftermarket replacement brake pads, check to confirm that the product identifies or confirms that it does not contain asbestos.
- Never assume a product is asbestos free unless it is stated either on the box/container or purchase invoice.
- Don't use grinders or other power tools to remove materials that might contain asbestos.
- Don't use compressed air, brushes, or other "dry" means to remove dust from friction materials that may contain asbestos.
- Post signs in work areas to inform workers of the hazards associated with automotive friction materials. Include the required precautions for handling those materials.
- Develop and enforce safe work procedures to minimize generating airborne dust. Suitable procedures include a HEPA filtered vacuum enclosure system or low-pressure spray equipment with a basin to catch run-off. Workers must be trained in these procedures.
- Ensure that workers exposed to dust from friction materials wear appropriate personal protective equipment—including disposable coveralls suitable for asbestos and at least half-face respirators fitted with P100 filters.
- Clean up any asbestos-contaminated tools, personal protective equipment and work surfaces.
- Dispose of waste material including debris, clean-up materials and personal protective equipment that may be contaminated with asbestos in sealed containers that are labelled as asbestos containing.
- Never eat, drink or smoke in the work area.

- When damaged asbestos-containing material is repaired, the employer must ensure that (a) the repair methods will seal all exposed, friable ends or edges, and (b) the methods used disturb the least amount of asbestos-containing material necessary to complete the repair.
- Always follow safe handling and disposal procedures for brake pads.
- Always wash hands and face after working on brakes or replacing brake pads.

For asbestos-specific workplace requirements, see Section 6.1-6.32 of the Occupational Health and Safety Regulation. WorkSafeBC Guidelines G6.24-1 through 6.24-4 provide more detailed information about the specific actions. The WorkSafeBC publication Safe Work Practices for Handling Asbestos provides procedures acceptable to the Board.

● Fluids and Hazardous Materials

Workers may be exposed to a variety of airborne and chemical substances such as fluids, solvents, dusts, fumes, gases, vapour, mists and smoke (see Break Pads & Asbestos). The aim is to keep concentrations of all contaminants as low as is reasonably practicable, regardless of whether they are known to present a health hazard. Vehicle emissions, particularly diesel, are a serious problem in automotive workshops, as are welding and paint fumes. Cleanup of dusts, in particular, can exacerbate the problem through re-suspension, and the risk can be transported from the initial exposure/emission point to another by air, wind, and clothing. Dusts, fumes and gases can also pose a potential fire explosion risk. Dusts, fumes and gases can accumulate or remain suspended in the air long after their production has ceased. Many chemicals can cause a sudden and very strong reaction if they come into contact with the skin. Fire and explosion can result in catastrophic consequences causing serious injury or death, as well as significant property damage. They occur when three primary elements come together:

- a) A fuel source (a flammable or combustible substance);
- b) An oxygen source (usually in the air); and,
- c) An ignition source (sufficient to cause ignition).

Employer Responsibilities Include:

- Ensure workers receive training in WHMIS.
- Provide personal protective equipment that is suitable to the nature of the hazard, is comfortable to wear, of suitable size and fit, and maintained and replaced as necessary.
- Train workers in the safe storage and handling of all hazardous materials.
- Ensure workers have received training in use of personal protective equipment.

Worker Responsibilities Include:

- Always wear personal protective equipment.
- Be alert to hazards and immediately report unsafe conditions to your supervisor.

Common Hazards Include:

- Burns and exposure to skin.
- Exposure to dust & fumes while testing a vehicle for emissions.
- Fire & Explosion.

Workers must follow written safe work procedures. These procedures may include the following actions:

Chemical Storage

- Solvents, paints, vehicle fluids, and other chemicals can cause poisoning if ingested. Avoid eating or drinking in the areas where these chemicals are stored/used.
- All chemicals should be properly labelled.
- Replace lids on containers after each use.
- Ensure storage areas are well ventilated.

- All shops need to have materials safety data sheets available and located where they may be easily found. If MSDS are stored electronically then instruct workers on how to retrieve them from the database.
- Supervisors should discuss the purpose of MSDS with workers and the importance of knowing how to read them.
- If the date on an MSDS is older than three years old or the MSDS is missing ask the supervisor or manager to get a new one.

Requirements for the condition and storage of containers include:

- The container of a hazardous substance must be designed, constructed and maintained in good condition to securely contain the substance.
- Any material used to contain, transfer or convey a hazardous substance must be reasonably resistant to the substance and to any other substance to which it may be exposed.
- If an open container of a hazardous substance could pose a hazard, the container must be kept sealed or covered when not in use.
- The amount of a hazardous substance in a work area must not exceed the quantity reasonably needed for work in progress, normally in one work shift.
- Bulk or reserve quantities must be stored in a designated area separate from the work area.
- Substances which are incompatible must not be stored in a manner that would allow them to mix in the event of container leakage, breakage or other such circumstance.
- A hazardous substance must be stored in a designated area, in a manner which ensures that it will not readily fall, become dislodged, suffer damage, or be exposed to conditions of extreme temperature.
- The designated storage area for a hazardous substance must be:
 - a) Designed and constructed to provide for the safe containment of the contents;
 - b) Clearly identified by signs, placards or similar means;
 - c) Designed and maintained to allow the safe movement of workers, equipment and material;
 - d) Provided with adequate ventilation and lighting; and,
 - e) In a location not normally occupied by workers, and not in a location such as a lunchroom, eating area, change room, clothing storage locker or passenger compartment of a vehicle.

Solvent Based Automotive Washers

- Follow manufacturer's instructions.
- Wear suitable PPE.
- Adhere to Safe Working Procedures posted on the parts washer.
- Keep washer away from heat, spark or ignition.
- Never use hot surfaces to clean parts.
- Never contaminate solvent with other chemicals.
- Drain all parts before placing in the parts washer.
- Empty the parts washer when not in use.

Fluid Change

- Always wear appropriate personal protective equipment when changing vehicle fluids.
- Attend to all spills immediately as they can increase the risk of slipping.
- Be sure to secure your vehicle whether or not you need to lift it to do the oil change. Depending on your size and the clearance allowed by your vehicle, you might not need to raise it off the ground (see Automotive Hoists).

Oil Change

(See Working Underneath a Vehicle if changing oil while the vehicle is on jack stands.)

1. When draining oil be sure to use something that can hold at least as many litres as your engine requires in oil.
2. Once the draining oil has slowed, you can remove the oil filter while waiting for the rest of the oil to drain. Place a container under the filter to collect oil that will come from the removal of the filter.
3. Once the filters are changed, and the oil has been drained, new engine oil can be added. Place a funnel in the opening for engine oil. Pouring engine oil from the container can become messy and cause slippage.
4. Add the appropriate amount of oil via the funnel. Consult the owner's manual if you are not sure how much oil to pour.
5. Replace the engine oil cap, and remove the collection tub from below the vehicle.
6. Check oil level.
7. Pour the used oil into appropriate oil containers.

Fueling

- Follow instructions of pump manufacturer and vehicles.
- Know the location of emergency fuel deactivation switches and fire extinguishers and how to operate them.
- Maintain contact with the tank during fueling to reduce static electricity.
- Always turn the ignition off when fueling vehicle.
- Never smoke or allow others around you to smoke when fueling vehicle.
- Never use a hand held or electronic device when fuelling.
- Do not overfill vehicle.
- Always be alert and attentive when fuelling a vehicle and never leave nozzle or vehicle unattended while fuelling.
- When finished fuelling, remove the nozzle from the tank, replace the tank cap, and replace the nozzle in the holder (if fuelling from an automatic pump).
- Clean spills immediately.
- If your skin comes into contact with fuel wash skin with warm soap water. Do not use hot water.
- If fuel gets in your eyes flush immediately.
- If overcome by vapours discontinue fuelling and remove to fresh air.
- Always ensure a fire extinguisher and spill kit is in close proximity.

Dusts, Fumes and Gases

- Regularly inspect and clean ventilation and dust collection systems to remove dust build-up.
- Install local exhaust ventilation to capture dust, fumes and gases at the source (e.g. use on-tool extraction when cutting or sanding).
- Always wear personal protective equipment (PPE) that is suitable for the nature of the work and the hazard (e.g. gloves, masks, goggles, face shields, respirators), fitted and comfortable to wear, of a suitable size and, maintained, repaired or replaced when required.
- Adopt good workplace hygiene practices—have a regular cleaning routine, preferably using vacuuming or wet mopping instead of sweeping.
- Lunchrooms and/or non-work areas should be considered clean zones, and contaminated PPE must be removed before entering these areas.

Vehicle Exhaust

Vehicle exhaust fumes can irritate the eyes and respiratory tract, and are a risk to health by breathing in. Carbon-fuelled engine fumes contain carbon monoxide, a poisonous gas. Prolonged exposure to diesel fumes, especially blue or black smoke, may lead to coughing and breathlessness. Long-term repeated exposure to diesel fumes over a period of about 20 years may increase the risk of lung cancer (American Cancer Society).

- Air contaminants must be controlled. The work area must be assessed to determine the potential for exposure of workers to harmful levels of exhaust.
- If a worker is or may be exposed to an exhaust in concentrations exceeding applicable exposure limits, suitable engineering controls must be installed and used correctly.
- If an internal combustion engine is operated indoors or in an enclosed work area, the engine must be adequately serviced and maintained to minimize the concentration of air contaminants in the exhaust
- Ensure workers are trained in the use of suitable PPE.
- Keep the workplace well ventilated.
- Connect an exhaust gas recovery system to the vehicle tailpipe when static running or when working in a vehicle inspection pit. It should always ventilate to a safe place in the open air where fumes will not be drawn back into the workshop.
- Always keep couplings and connections in good condition to prevent leaks.
- You should not rely on vehicle access doors being left open to provide ventilation as in winter these will be kept closed.
- Don't rely on catalytic converters to run engines safely indoors. They are less effective when exhaust gases are relatively cool (e.g. from vehicles idling for long periods or used intermittently for short periods). Catalytic converters do not remove toxic oxides of nitrogen.
- Follow hot work procedures for welding and cutting.
- Use equipment as directed by manufacturer.
- Ensure clothing is free from oil, diesel, gasoline or other ignitable materials. Remove any lighters, matches, or other combustible materials prior to commencing work.

Fire and Explosion

- Store flammable materials in their original, clearly labelled and tightly sealed containers, away from heat sources, ignition sources or direct sunlight.
- Remove hazardous substances from work area that are not immediately needed.
- Avoid mixing different liquids.
- Eliminate short circuits.
- Have suitable, regularly maintained fire extinguishers readily available.
- Ensure workers are trained in the use of fire-fighting equipment.
- Dispose of all waste materials, including chemicals and paint/solvent-soaked rags, as soon as possible in accordance with all municipal, provincial and federal regulations.

Fire Risk

- Know the location of fire exits, alarms and the nearest extinguisher.
- Know how to shut off the gas disconnects and main gas valves.
- The proper use of the A, B, C, and D-type fire extinguishers.
- Keep fire exits, alarms, and firefighting equipment free of obstructions.
- In case of fire:
 - Warn others—yell for help if required;
 - Use fire extinguishers if the fire is small; and,
 - Call 911 if the fire too large to control.
- In the case of electrical fire, propane, or gas fires, shut off the supply.

Compressed Gasses and Air

- Always follow the manufacturer's instructions for safe operation.
- Check cylinders for their rated pressure and contents. Immediately notify your supervisor if the cylinder is damaged or discharging gas.
- Keep cylinders upright and properly secured in a dry, well-ventilated area. Store away from doors, stairs, traffic and heat sources.
- Ensure cylinders are not secured to equipment that could form an electrical circuit.
- Never rely on the colour of the cylinder for identification. Colour coding may vary.
- Never smoke sign near the storage area.
- Never slide, drag, or drop cylinders. Use proper moving equipment such as a dolly.
- Remove the regulator and replace the cap, if applicable, before moving cylinders.
- Always keep the valve keys or wrenches nearby so cylinders can be closed quickly.
- Ensure the MSDS for any gas use is available.
- Store cylinders in a well ventilated area, and in an upright and restrained position to prevent them from falling.
- Ensure no slip/trip hazards are present in workspaces.
- Regularly inspect and maintain regulators and valves and keep them away from contaminants.

- Perform pre-operational inspections for leaks. Inspect for rusting or pitting on compressors in accordance with WorkSafeBC regulations.
- Try to store compressors in an area that will minimize noise.
- Drain air tanks daily.
- Ensure all airlines are rated for compressed gas.
- Check to ensure all fittings are securely connected prior to being pressurized.
- Report any defects to supervisor.

● Office Safety

Compared to the service bays, offices are considered safe environments. However, offices still have their fair share of workplace incidents and accidents due to a lack of a strong office safety culture. A closer look at office environments can reveal underlying hazards and risks that jeopardize the health and safety of workers. It is for this reason that office workers should know the basics of office safety and understand its importance.

Discuss that office environments are sometimes over looked in terms of their hazard potential.

Employer Responsibilities for Ensuring General Office Safety Include:

- Discuss the importance of workplace safety, staying alert on the job and not indulging in horseplay.
- Having a plan for dealing with emergencies and instructing employees on emergency preparedness.
- Instruct employees on emergency preparedness and evacuation plan.
- Instruct employees to report any unsafe conditions.
- Tour the office area and point out emergency equipment such as fire extinguishers, eye wash stations, first-aid, etc.
- Ensure workers are made aware of all known hazards in the workplace, including:
 - Situations that may result in a slips and trips injury.
 - Falls from elevation or at same level.
 - Lifting or movements that may result in an MSI.
- Right to refuse unsafe work, and the process for correcting unsafe situations.
- Ensure workers are informed, educated, trained and supervised. Provide guidance which includes information on:
 - Material handling techniques.
 - Ladder safety.
 - Working alone.
 - Emergency procedures.
 - Workplace violence.
 - Workplace safety committee.
 - How to report unsafe conditions.
 - WHMIS.

Worker Responsibilities for Ensuring General Office Safety Include:

- Report any unsafe condition conditions or any hazard you cannot fix yourself.
- Stay alert for workplace hazards and listen carefully to safety instructions.
- Be alert to hazards. Report them immediately to your supervisor or employer.

- Follow safe work procedures and work safely at all times.
- Never work under the influence of alcohol, drugs or any other substance, or if you're overly tired.

Common Hazards Include:

- Working behind a counter/dealing with customers or on the phone.
- Using office equipment.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Close drawers and doors after use.
- Watch for boxes stacked precariously.
- Store heavier files in the bottom drawer of file cabinets.
- Store sharp objects, such as pens, pencils, letter openers or scissors in drawers or with the points down in a container.
- Do not connect multiple electrical devices into a single outlet.
- Keep doors in hallways fully open or fully closed.
- Use a staple remover, not your fingers, for removing staples. Turn off and unplug office machines before adjusting, lubricating or cleaning them.
- Do not use fans that have excessive vibration, frayed cords or missing guards.
- Do not use frayed, cut or cracked electrical cords. Do not store or leave items on stairways or walkways.
- Attend to spills or leaks immediately by using a paper towel, rag or a mop and bucket.

Proper Lifting Procedures

- If load is too heavy try to break down into smaller parts.
- Check the pathway and clear any obstacles.
- Check to see if any doors need to be opened or closed.
- If you are unsure of the weight of the load test first by lifting one corner. If the load is too heavy, ask for assistance.
- Performing the lift:
 1. Stand with feet shoulder width apart in a staggered position.
 2. Move in close to the load.
 3. Bend with your knees and keep head upright and maintain natural spinal curves.
 4. Secure your grip.
 5. Use a smooth controlled motion to lift the load.
 6. Avoid twisting motions when lifting.
- Setting the load down:
 1. Get as close as possible to the area you will place the load.
 2. If possible, place heavy loads at elbow height.
 3. Bend with your knees and keep head upright and maintain natural spinal curves.

4. Keep the load close; try not to extend arms out away from the body.
5. Once the load is where you want it, ensure the load is secured and release your grip slowly.

Emergency Safety Procedures

- Follow procedures in the event of a threat or violent incident.
- Participate in annual emergency procedure drills.
- Know where emergency phone numbers are posted.
- Know where all fire extinguishers are located and how and when they should be used.
- Know where any other emergency equipment (e.g. defibrillator) is located should it be needed in an emergency.
- Know where fire alarms and fire exits are located.
- Know what you should do in the event of an earthquake.
- In case of evacuation know where the assembly point outside the building is and who you should report to.

General Shop Safety

Employer Responsibilities for General Shop Safety Include:

- Conduct monthly inspections.
- Ensure workers conduct pre-shift equipment inspections.
- Ensure the work area is safe.
- Ensure suitable first aid is available.
- Provide a safe work environment.
- Take immediate action when a worker or supervisor informs you of a hazardous situation.
- Implement control measures to minimize the risk to workers.

Worker Responsibilities for General Shop Safety Include:

- Perform work in a safe manner.
- Be alert to hazards and immediately report unsafe conditions to your supervisor.

Common Hazards Include:

- Falling Objects.
- Unstable loads.
- Slips, trips & Falls.
- Poor visibility and lack of egress and access.

Workers must follow written safe work procedures. These procedures may include the following actions:

General Shop Safety Rules

1. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms. Keep aisles and walkways free of debris or clutter that would cause obstruction.
2. Report damaged floors or surfaces.
3. Use a ladder or step stool to retrieve or store items that are located above your head.
4. Use the handle when closing doors, drawers and files.
5. Obey all posted safety and danger signs. Use caution signs/cones to barricade slippery areas such as freshly mopped floors.
6. Do not run on stairs or take more than one step at a time. When transporting bulky items do not block your view; use a dolly or hand truck or get assistance from a fellow employee.
7. Do not tilt the chair you are sitting in on its back two legs.
8. Use handrails when ascending or descending stairs or ramps. Avoid walking on wet, icy, slick or oily areas if possible. If required to cross a slippery surface, walk slow and flat-footed. Hold onto a handrail or solid

object, if present, to maintain balance. Use provided aisles, walkways or sidewalks. Clean shoes water, mud, grease or other substances that could cause a slip or fall.

9. Provide adequate lighting.
10. Do not move faster than conditions allow on slippery surfaces or in congested areas.
11. Use a cord cover or tape when running electrical or other cords across aisles or other hazardous areas.

Ladders

- Ladders should only be used if there is no other reasonably practicable means of accessing different levels that is safer and more efficient.
- Extension or single ladders should only be used as a means of access to or egress from a work area. They are not a place to work from except for light work of short duration that can be carried out safely.
- When working space and movement area are restricted on ladders, awkward and limited working positions can lead to musculoskeletal disorders.
- Select a ladder that is the most suitable for the job and the work environment. Use ladders rated for industrial use (at least 120kg) as they are designed to carry more load and are of stronger construction than domestic types.
- Ensure ladders are fitted with non-slip safety feet.
- Store ladders in a dry place to prevent warping or corrosion and check their condition frequently.
- Have ladders periodically inspected by a competent person (someone who is qualified either through experience and/or training).

Instruct Workers in These Rules of Ladder Use:

1. When setting up or moving a ladder check for overhead obstructions (e.g. electrical cables).
2. Place ladders on firm, dry, level ground, engaging all locks and braces.
3. Ensure compliance with the manufacturer's load rating.
4. Only one person should be on a ladder at any given time.
5. When ascending or descending, maintain three points of contact at all times—two feet and one hand, or two hands and one foot.
6. Climb and descend facing the ladder.
7. Never carry anything when climbing or descending.
8. Keep centred between the ladder sides.
9. Never lean sideways or over reach.
10. Be careful when pulling or moving items from above (e.g. from shelves) as this may cause over balancing or objects falling on people below.
11. Never stand above the ladder tread or rung indicated as the maximum safe working height.
12. Only conduct light work from a ladder.
13. If a ladder is placed near a doorway, fix the door in the open position or close and lock it. Alternatively, place another person on guard at the foot of the ladder. Warning signs may also be used.

Working Surfaces

- Report any damaged floors and surfaces, platforms, ladders, stairs or walkways.
- Correct unsafe situations related to weather.
- Clearly mark all walkways, ensure they are of adequate width, and implement a clean and clear walkway policy.
- Design electrical and air plug-in points to limit cords and hoses across workshops.
- Attach mats to floor surfaces.
- Restrict access to areas that are potentially hazardous.
- Provide ramps, not steps, where floor level height changes.
- Provide adequate lighting.
- Use warning signs (e.g. wet floors) when performing general clean-up duties.
- Implement a 'good housekeeping' policy to keep all work areas clean and clear.

Storage Racks

Moving materials on and off storage racks, either manually or using mobile equipment, puts workers at risk of injury due to:

- Slips, trips, and falls.
- Overexertion.
- Being struck by falling objects.

There are additional risks if the racks are not properly installed, inspected, used, or maintained. The racks themselves can then be a hazard if they become unstable or collapse, thus increasing the risk of injury to workers.

Factors that can increase the risk of injury include:

- Overloading.
- Poor maintenance (resulting in deterioration).
- Unsafe loading practices.
- Ensure racking is suitable for the product type and that load ratings are known and not exceeded.
- Whenever possible, store tires and parts at shoulder level.
- Minimize double handling by creating storage areas as close as possible to where work is done.
- Roll, rather than lift by hand, car and truck tires and wheels, or use mechanical aids.
- Use mobile access platforms to access stock stored above shoulder height.
- Ensure mezzanine storage areas have guard rails and purpose-built stair access with a hand rail.
- Use mechanical aids to lift items up to racking above shoulder height or to mezzanine storage.

Forklift

Forklifts offer a practical materials handling solution, however, they continue to be associated with workplace deaths and injuries. While they are compact and manoeuvrable, they can become unstable when carrying loads. Even at low speeds, forklifts can cause serious injuries.

Forklifts and other materials-handling equipment, such as powered pallet jacks can present risks to workers including rollovers and collisions with workers and pedestrians. Forklift operators and other equipment operators must have been properly trained to operate the equipment safely. It's not just the operator who may be injured: pedestrians/other workers/visitors can also be struck by a forklift or its load.

Workers who operate forklifts must follow written safe work procedures. These procedures may include:

- Must always wear seatbelts when operating a forklift.
- At the start of each shift, perform both a visual inspection of the general condition and cleanliness of the lift truck, as well as an operational check to test its proper functioning. If you notice anything that may affect the normal operation of the forklift, immediately alert your supervisor.
- Employees must be trained and certified to work safely with forklifts.
- Do not allow workers to stand on forklift arms as part of loading and unloading.
- Keep your hands, arms, head, feet and legs inside the forklift truck.
- Ensure operators travel in a manner that does not result in reduced visibility due to the load placement.
- Travel with forks as low as possible from the floor and tilted back.
- Designate a safety zone for the delivery driver—they should be seen by the forklift operator at all times when their vehicle is being loaded or unloaded.
- Introduce clear and effective communication systems between the forklift operator and others occupying the work area.
- If in the same work area, operators and workers must wear suitable high visibility garments with tear away properties.
- Use flashing lights, reverse beepers and warning sounds/horns.
- Remove keys when forklifts are not in use.
- Ensure the weight carrying capacity is clearly marked and followed. Regularly service and maintain forklifts, and keep these records.
- Clear objects that could cause an accident. Keep an eye out for oil spots, wet spots, loose objects, holes, rough surfaces, people and vehicles on the floor or roadway.
- Ensure correctly fitted seat belts are worn by operators. Forklift tines are not to be used for any unintended purpose (e.g. workers do not stand or travel on them). Forklift tines are lowered when not in use. Use only approved forklift attachments.
- Park only in an approved location. When leaving the lift truck unattended, secure it by setting the brakes, lowering the forks or load to the floor, neutralizing the controls, and turning off the motor switch.

● Electric & Hybrid Vehicles

With the growth in environmental awareness, the use of electric and hybrid vehicles (E&HVs) is increasing. There are substantial differences in the designs of Electric and Hybrid Vehicles from different manufacturers. Having information specific to the manufacturer and the vehicle being worked on is important in identifying what actions are necessary to work safely.

Employer Responsibilities Include:

- Ensure that workers have had appropriate training.
- Ensure that workers are made aware of the hazards associated with working on or near electric vehicles and hybrids.

Worker Responsibilities Include:

- Reporting any unsafe conditions to a supervisor.
- Perform maintenance and repairs in accordance with the vehicle manufacturer's technical instructions.

Common Hazards Include:

- Corrosion.
- Lifting battery.
- Electro shock.

Workers must follow written safe work procedures when working on or near electric or hybrid vehicles.

These Procedures May Include the Following Actions:

- Remote operation keys should be kept away from vehicle. If a key is required during the repair the person working on the vehicle should check to see that the vehicle is in safe condition before retrieving the key.
- Always check the vehicle for any signs of damage to high voltage cabling or electrical components before starting work on the vehicle. Unless the work being performed requires the vehicle to be energised always disconnect the high voltage battery in accordance with manufacturer's instructions.
- In situations where a vehicle has been damaged and/or it is not possible to fully isolate the high voltage electrical system and to discharge the stored energy in the system refer to the manufacturer's instructions about what control measures should be implemented to eliminate any potential risks.
- Know the location of the high voltage service plug and how to disconnect it.
- Always wear appropriate PPE when working on or near electric vehicles and hybrids.
- Avoid towing an electric vehicle or hybrid unless it is determined it is safe to do so.
- People who are moving electric vehicles around should ensure others are aware as they may not be able to hear them.

● Service Pit

The hazards of working in or around vehicle service pits can include falls into an unguarded or uncovered pit, asphyxiation, explosion or fire. Some fuel vapors from vehicles and gaseous by-products of combustion have a tendency to settle in low areas, such as vehicle service pits.

Employer Responsibilities Include:

- Conduct a risk assessment and implement control measures to eliminate or control all known hazards.
- Address known fall, struck by, ergonomic, fire and exposure risks.
- Inform workers of all known hazards.
- Provide all necessary information, education, training and supervision to workers.
- Provide suitable PPE.
- Ensure employees are instructed in safe work procedures.
- Conduct a hazard assessment of the area to ensure hazards have been mitigated.

Worker Responsibilities Include:

- Following safe work procedures.
- Reporting any unsafe conditions.
- Wear suitable PPE.

Common Hazards Include:

- Guiding a vehicle backwards over a service pit.
- Falling into service pit.
- Spilled oil or other slippery substances left unattended.
- Accumulation of noxious gases.
- Struck by a vehicle moving forward or backward over a service pit.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Check pit for flammable or other hazardous vapours.
- Remove all flammable/combustible materials from pit.
- Ensure the guardrail is up around the service pit when not in use.
- Guide vehicles over the service pit from the side.
- Never stand in front of a vehicle as you direct it over the service pit as vehicle may move forward unexpectedly.
- Set chocks to keep vehicle from moving.
- Keep the floor clear of spills, tools, parts, and other debris.
- Ensure you have good lighting and/or use a portable work light if necessary.

- Stay alert for signs of noxious gases (you may not be able to smell them so stay alert to how you're feeling: dizziness, nausea, irritability).
- If a co-worker is displaying any of these signs remove them from the work area immediately and call emergency first aid.
- Do not jump across service pit.
- Always practice good housekeeping to avoid tripping or slipping.
- Worker should not be in the pit while coming on or off the service pit.
- Conduct inspection of service pit before commencing work. Ensure service pit equipment and safety devices are in good working order.
- Ensure there are no hazards present in the pit.
- If a co-worker is displaying signs of exposure to exhaust gases or chemicals, call emergency services and administer first aid.
- Conduct welding work in a location away from the service pit.

Other Suggested Best Practices

- Consider painting the pit interior white and outline the edges for at least 600mm in a conspicuous colour (e.g. safety yellow).
- Consider installing sectionalized guard railing designed to fit into prepared floor sockets, or suspend chain barriers from removable steel uprights to prevent people walking into open pits.
- Consider covering pits when not in use with either traditional hardwood covers, or the better solution of heavy interlocked steel plates designed to run through guide rails (much like a roller shutter).
- Use ventilation systems with vents in the side walls of the pit to vent vapours and fumes.
- Ensure all portable or permanent lighting and/or electrical equipment within the hazardous zone of the pit is intrinsically safe.
- Never service LPG-powered vehicles over or next to a service pit.
- Avoid work involving welding or oxy cutting inside or adjacent to service pits.

● Tool, Machinery and Equipment Safety

Employer Responsibilities Include:

- Implementing control measures to minimize the risk to workers.
- Discuss the various tools that present hazards in the shop.
- Ensuring that tools and equipment are suitably maintained and fit for purpose.
- Conduct routine inspections of tools and equipment.
- Ensure tools are designed and fit for purpose.
- Provide workers education and training on specific equipment they will use. Only permit authorized personnel to use such equipment.
- Ensure guards are in place and in good condition.
- Provide effective exhaust ventilation for welding and cutting work.

Worker Responsibilities Include:

- Learning and following safe work practices and procedures.
- Being alert to hazards and immediately reporting hazards to their supervisor.
- Performing work in a safe manner.
- Inspect tools and equipment prior to use and report defective equipment.

Common Hazards Include:

- Welding in a poorly ventilated area.
- Struck while loosening a bolt with a hammer.
- Working from height.
- Using tools without training or personal protective equipment or using the wrong tool for the job.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Check to ensure that all guards and safety devices are in place and functioning properly.
- Inspect all power tools prior to use. Check for any unusual vibrations or noises before using powered equipment.
- Inspect any hand tool prior to using it. Never use a tool if it has splinters, burrs, cracks, or splits, or if the head of the tool is loose.
- Do not use power equipment or tools for which you have not been trained.
- Keep power cords away from the path of other moving equipment.
- Do not carry plugged in equipment or tools with your finger on the switch.
- Never carry tools by the cord.
- Always disconnect a power tool by the plug, not by pulling the cord.
- Never leave tools or equipment on unattended.
- Never operate power tools with wet hands or when standing on wet floors.

- Always maintain a firm grip on power tools at all times when in use.
- Turn off electrical tools and disconnect from power source before doing any repairs or maintenance of the tool.
- Do not drive over, drag, step on or place objects on a power cord.
- Tag defective tools as 'Out of Service'.
- Never use a defective tool or any tool marked 'Out of Service' and never perform makeshift repairs.
- When handing a tool over to someone else direct sharp points or cutting edges away from you and the other person.
- Transport hand tools in tool boxes or tool belts.
- Always wear appropriate and/or recommended personal protective equipment when performing work with equipment and tools.
- Turn off power tools before making adjustments or changing settings.
- Machinery and equipment should only be used for its intended purpose.

Air Tools (e.g. Impact Wrench)

- Never wear loose clothing or accessories when using air tools.
- Use ear protection where noise exceeds 85 Decibels (see Noise Exposure).
- Prolonged exposure to vibrations may cause tingling, numbing, or painful sensations in the hands, fingers or arms.
- Never torque bolts or nuts.
- Never carry an air tool by the air hose.
- Always disconnect the air supply before installing or adjusting air tool sockets or before performing tool maintenance.

Automotive Hoists

Employer Responsibilities Include:

- Ensuring the rated capacity is marked on each automotive lift, portable automotive lifting device or other vehicle support.
- Ensuring the rated capacity of a device is not exceeded.
- Developing and implementing written safe work procedures.
- Providing education, training, and supervise workers on safe work procedures.
- Informing workers of all know related hazards and their control measures.
- Develop and implement written safe work procedures for operating automotive lifts and post them in the work area.
- Educate, train, and supervise workers on safe work procedures.

Worker Responsibilities Include:

- Learn and follow safe work practices and procedures.
- Perform work in a safe manner.

Common Hazards Include:

- Vehicle falling due to not being properly centred on hoist.
- Vehicle not sufficiently raised.
- Crush injuries caused by failure of hoist.

Workers must follow written safe work procedures. These procedures may include the following actions:

Procedures for Lifting a Vehicle:

1. Remove all cords, hoses, or any other debris from the lift area and wipe all grease and oil spills before driving into the service bay.
2. Position the lift arms, adapters, and clear of the path of the vehicle's tires before driving the vehicle into the service bay.
3. Never leave controls unattended while the lift is in motion.
4. Use the lift to raise the vehicle about one foot off the ground then moderately test the rear or front bumper of the vehicle to ensure that the vehicle frame is stably mounted on the lift support's contact pads.
5. Ensure all lifting pads contact the vehicle solidly before lifting the vehicle.
6. Once the vehicle is secure on the lift, lift the vehicle to the desired work height and visually check those contact points for misalignment before going under the vehicle.
7. As you raise the vehicle you will hear a clicking noise which indicates that the lift's locking device is engaged. If you do not hear a 'clicking' noise, stop the lift, fully lower the vehicle and use another lift. Place an 'Out of Order' tag on the lift and/or alert your supervisor.

8. If you will be working under a lift that will be positioned at a point below where the lift's locking device engages, place four jacks under the vehicle's frame or suspension for additional support before working underneath the vehicle.
9. Place wheel chocks in effective locations according to manufacturer's instructions.

Safe Work Practices When Working with or Near Automotive Lifts. These May Include:

- Never stand in the path of a vehicle being driven into a service bay.
- Stand to one side of the hoist when directing a vehicle onto the hoist—do not stand directly in front of the vehicle.
- Wherever practicable, always have a person who is familiar with the hoist drive the vehicle onto the hoist.
- Do not use any lift that has cracked contact pads, cracked lift arms, or any other damage or any missing guards.
- Never use wood or concrete blocks as an extender.
- Never 'tie open' the lift's control while the lift is in motion.
- If the vehicle begins to slip off the lift run in the opposite direction of the fall but never toward a wall or area that will trap you between the object and the vehicle.
- Before removing a vehicle from the service bay position the lift arms and support to the centre of the lift away from the wheels of the vehicle.
- Never raise a vehicle with anyone in it.
- Always stand to one side of the hoist when directing a vehicle onto the hoist—never stand directly in front of the vehicle.
- Keep records of all repairs, maintenance, inspections and modifications to a lift and have them available at the workplace.
- Ensure the lift is appropriate and has the capacity to raise the vehicle.
- Always wear safety goggles when working underneath vehicles.
- Watch lift at all times.

Procedures for the Installation, Operation, Maintenance, Repair and Compliance of Automotive Hoists

Installation

1. Section 12.75 of the *OHS Regulations* states that automotive lifts must be assembled and installed by a qualified personnel. Under section 4.3 the installation must be done according to the manufacturer's instructions. If instructions are unavailable (as may be the case if purchased used) the installation should be done following the direction of a manufacturer representative or professional engineer.

Operation

2. Any operation, inspection, repair, maintenance, or modification of a vehicle support or lift must be carried out according to the manufacturer's instructions or the written instructions of a professional engineer.
3. A lift operator requires training that follows the manufacturer's operating procedures. An employer or qualified training agency may conduct the training. Keep all records of training. If no operating

instructions are available a manufacturer's representative may conduct the training, or the employer may hire a professional engineer.

Maintenance and Repair

4. Automotive lifts must be maintained by a manufacturer or someone who is qualified to perform this work.
5. Operators can be trained to perform routine maintenance by a manufacturer's representative or a qualified automotive lift technician.
6. Section 12.78 of the *OHS Regulation* requires that automotive lifts be inspected monthly unless the manufacturer requires more frequent inspections. Routine maintenance must be carried out in accordance with manufacturer's recommendations. Records must be maintained for each lift inspection.
7. Automotive lifts must be repaired in accordance with manufacturer's recommendations and be performed by:
 - A qualified automotive lift technician.
 - A qualified independent lift service company.
 - A professional engineer.
8. If a lift has been retrofitted or modified a manufacturer representative or professional engineer must certify that the modified lift meets ANSI Standards for Automotive lifts – Safety Requirements for the Construction, Care and Use in accordance with *OHS Regulation* 12.74. The new rated capacity must also be certified and must not exceeded.

Compliance

9. All automotive lifts must meet *ANSI/ALI B153.1-1990, American National Standard for Automotive Lifts – Safety Requirements for the Construction, Care, and Use*.
10. Lifts that comply or conform to this standard must have a compliance label from the Automotive Lift Institute (ALI). If your automotive lift does not have this sticker you must obtain written confirmation that it conforms to the standard from the manufacturer or a professional engineer. The following wording affirms conformity to the standard:

The automotive lift was manufactured to conform to the requirements of ANSI/ALI B153.1-1990. A safety standard developed cooperatively with industry and those substantially concerned with its scope and provisions. The manufacturer is responsible for the construction of this product to this standard.

● Noise Exposure

Unwanted or damaging sounds may cause noise-induced hearing loss or tinnitus (ringing in the ears). It may also cause other health effects such as stress, hypersensitivity to noise, and increased blood pressure and heart rate. It can also interfere with communication at work, which can lead to incidents.

Employer Responsibilities Include:

- Conducting a risk assessment that identifies the hazardous noise levels.
- Implementing a noise control and hearing conservation program if your workers are exposed to sound greater than 85 dBA (over an eight-hour work shift) or 140 dBC peak sound level.
 - A program must include risk controls to address noise hazards.
 - A program must include specific elements, such as noise measurement, hearing tests, hearing protection, and engineered noise controls.
- Conduct a risk assessment that identifies the noise hazardous workers may be exposed to.
- Provide hearing protection.
- Implement control measures to minimize the risk to workers.

Worker Responsibilities Include:

- Correctly use noise enclosures, where available.
- Correctly use suitable PPE. Ensure a proper seal and fit.
- Ask for replacement hearing protection if damaged.
- Never altering hearing protection, or modifying the size or shape of earplugs. If they're uncomfortable, try a different size.
- Ensure PPE is compatible with other PPE.
- Be alert to hazards and immediately report unsafe conditions to your supervisor.
- Wear appropriate personal protective equipment.

Common Hazards Include:

- Gradual noise induced hearing loss or tinnitus.
- Communication errors due to noise level.
- Hypersensitivity to noise including increased blood pressure and heart rate.

Workers must follow written safe work procedures. These procedures may include the following actions:

- Eliminate the noise source.
- Keep noise levels below the exposure standard of 85 Decibels in an 8-hour day so that critical situations can still be communicated despite noise. Substitute noisy machinery with quieter models—or 'buy quiet'

when purchasing new or replacement equipment, which is a cost-effective way to control noise at the source.

- Introduce engineering controls to treat noise at its source or in its transmission path (e.g. use sound dampeners or silencers, noise barriers/partitions/ screens and isolation).
- Introduce administrative controls to reduce the number of workers exposed to noise (e.g. training and education, job rotation, job redesign or designing rosters).
- Provide personal protective equipment (PPE) that is:
 - a) Suitable for the nature of the work and the hazard (e.g. earmuffs, ear plugs).
 - b) Comfortable to wear, and of a suitable size and fit.
 - c) Maintained, repaired or replaced when required.
 - d) Used or worn by workers who have been trained in its use and care.
- If workers are frequently required to wear PPE to reduce the risk of hearing loss from noise exceeding the exposure standard of 85 Decibels, implement an audiometric testing regime. Keep testing records.
- Conduct a walk-through inspection of your workplace to help determine:
 - a) Sources of excessive, distracting or disruptive noise (e.g. is it difficult to hear a normal voice within one metre of a noise source?).
 - b) Workers likely to be exposed to excessive noise.
 - c) Work activities that are noisy and may pose a risk to hearing.
 - d) Ways of reducing noise levels.
- If you are unsure about the level of exposure or how to minimise the risks effectively, you should take the next step to assess hearing loss risks.

● Vehicle Safety: Service Bays/Test Drives/Inspections

Employer Responsibilities for Entering/Exiting Service Bays and/or Test Driving Vehicles Include:

- Conducting a risk assessment that identifies the hazards workers may face when entering and exiting the service bay with a vehicle.
- Implement control measures to eliminate or minimize risks to workers.
- Explain what can be done to minimize the risk of vehicular incidents.

Worker Responsibilities for Entering/Exiting Service Bays and/or Test Driving Vehicles Include:

- Wear suitable PPE with tear-away properties.
- Activate headlights and hazard lights.
- Conduct a circle check before operating vehicle.
- Learning and following written safe work procedures.
- Remain alert to hazards when operating a motor vehicle and report hazards to supervisor.

Common Hazards Include:

- A vehicle moving in an unexpected direction.
- Moving a vehicle in and out of a service bay.
- Driving an unfamiliar vehicle.

Workers must follow written safe work procedures. These procedures may include the following actions:

Service Bays and Inspections

- Never walk or stand directly behind or in front of a vehicle with a driver behind the vehicle.
- Always keep eye contact with the driver behind the wheel and keep the vehicle in your line of sight.
- Never ride in the back of a pick-up bed.
- Stay clear if vehicles in motion.
- Ensure reversing areas are well light. Use a person, if practicable, to help direct reversing vehicles.
- Stand to the side when directing vehicles over service pits or onto hoists.
- Familiarize yourself with lights, turn signals and windshield washers before putting the vehicle in motion.
- Be alert - anticipate road conditions, and the actions of other drivers.
- Do not drive over 5kms per hour inside a service bay.
- Shut all doors and fasten your seatbelt.
- Never move vehicle with doors and hood open.
- Maintain a 3 point contact when climbing in and out of large trucks.
- Drive up or down, never across a slope.
- Before leaving the vehicle always engage the emergency brake.
- Never approach a vehicle while in motion; allow the driver to come to a full stop before approaching.
- Sound the horn to alert other workers before backing vehicle in and out of service bay.

- Tie down or latch unsecured materials and/or equipment in trucks beds.
- Never mount or dismount a moving vehicle.
- Wear personal protective equipment.
- Wear gloves when inspecting near hot surfaces or sharp edges.
- Use proper ergonomic postures when inspecting engine compartments, under hood, and under vehicle (see Ergonomics).

Test Drives

- Comply with all traffic regulations when driving.
- Assess hazards while driving.
- Drive according to road conditions.
- Never drive under the influence of alcohol or drugs.
- Do not use a cell phone for any purpose while driving.
- Plan your route.
- If visibility is restricted, before reversing sound your horn; if the driver is a tight position or uncomfortable with reversing on their own ask for assistance.
- If working outdoors or providing roadside assistance in cold/hot weather always wear appropriate clothing.

Roadside Maintenance

Hazards when working on a roadside include high-speed traffic, poor visibility, weather and ground conditions. Workers could be struck by a passing vehicle or crushed by the vehicle moving off the jacks. Other risks related to isolation and communication arise if workers are required to work off-site or provide roadside assistance.

When Performing Roadside Service the Following Factors Need To Be Considered:

- Safety of the work area (e.g. lighting, visibility, hazards, ground stability).
- Signs and lights from/on/around/adjacent to the disabled vehicle and assistance vehicle to warn approaching drivers (e.g. high-visibility triangles/ cones, flashing lights).
- Provision of high-visibility, retro-reflective clothing to capture vehicle headlights at dusk/night.
- Vehicle payload stability.
- Availability of lifting or manual handling aids (e.g. wheel dolly, brake drum lifter).
- Two-way communication with workshop supervisor or another person.
- Is police traffic control required to make the area safe?
- If so, consider towing the vehicle to a safe work area before repairs are attempted.

● Employee Well-Being: Violence, Bullying and Harassment, Fatigue, and Emergency Preparedness

Well designed and managed workplaces can play a role in promoting worker health and well-being, as well as minimising ill health and facilitating recovery and return to work after injury or illness.

A mentally healthy workplace protects and promotes psychological health by preventing common psychosocial hazards such as fatigue, bullying, discrimination and violence.

Employer Responsibilities Include:

- Must implement procedures for responding to reports or incidents of bullying and harassment. The procedures must ensure a reasonable response to the report or incident and aim to fully address the incident and ensure that bullying and harassment is prevented or minimized in the future.
- Educate, train, and supervise workers on safe work procedures.
- Inform workers how they may be at risk.

Worker Responsibilities Include:

- Immediately report any injury to a first aid attendant or supervisor.
- Take the initiative. Make suggestions to improve health and safety.
- If you are a worker and you have witnessed or experienced bullying and harassment in your workplace, you must report it to your employer. If your employer has not taken reasonable steps to address the incident, you can call the Prevention Information Line to contact an officer to discuss the incident. If the matter is still not resolved after reporting to your employer and speaking with a prevention officer, you may submit a Bullying and Harassment Questionnaire.

Hazards Include:

- Inadequate training and time permit to complete job.
- Unrealistic expectations.
- Poor communication.
- High stress.

Workers must follow written safe work procedures. These procedures may include the following actions:

Workplace Violence

See below for steps for conducting a violence risk assessment:

<https://www.worksafebc.com/en/resources/health-safety/books-guides/a-workbook-for-employers-and-workers-preventing-violence?lang=en>

<https://www.worksafebc.com/en/resources/health-safety/information-sheets/steps-for-conducting-a-violence-risk-assessment?lang=en>

Fatigue

Fatigue is a state of feeling very tired, weary or sleepy. Fatigue results from lack of sleep and can be heightened by prolonged periods of mental and physical activity or stress and anxiety. Boring and repetitive tasks may also intensify feelings of fatigue. Over the long term fatigue can result in health effects, such as loss of appetite and digestive problems.

Signs of Fatigue Include the Following:

- a) Tiredness or sleepiness.
- b) Memory lapses.
- c) Difficulty concentrating.
- d) Slower reaction times.

Ways To Reduce Fatigue:

- Reduce and/or monitor caffeine intake.
- Monitor medications that can cause fatigue.
- Workers with sleep disorders such as narcolepsy, insomnia and other disorders should seek medical advice.
- If the job requires long hours or overtime, consider that workers have enough time for other daily activities (eating, commuting, etc.). Consider providing amenities such as meals, or an area where employees can go to take a nap or quiet time.
- Provide a work environment that has good lighting, a comfortable work environment, and reasonable noise levels.
- Provide for variety in the job. Be flexible when assigning jobs.
- When stress is high, stop the job and shift to a simpler job for a mental health break.
- Give a tool talk about fatigue and suggest the following remedies:
 - a) Be consistent in your sleep patterns. Go to bed and get up at the same time everyday.
 - b) Turn out the light when going to bed.
 - c) Avoid reading or watching television in bed.
 - d) Establish regular eating habits.
 - e) Avoid caffeinated beverages or alcoholic beverages right before going to bed.
 - f) Exercise regularly.

Bullying and Harassment

Bullying and Harassment Can Include:

- Verbal aggression and yelling.
- Humiliating initiation practices or hazing.
- Spreading malicious rumours.
- Calling someone derogatory names.

But Does Not Include:

- Expressing differences of opinion.
- Offering constructive feedback.
- Reasonable action taken by an employer or supervisor related to the management and direction of workers.

Steps To Take Include:

- a) Develop a policy statement with respect to Workplace bullying and harassment not being tolerated.
- b) Develop and implement procedures for workers to report incidents of workplace bullying and harassment.
- c) Develop and implement procedures how the employer will manage incidents and complaints of workplace bullying and harassment.
- d) Inform workers of the policy statement.
- e) Train supervisors and workers to:
 - Recognize the potential for bullying.
 - Respond to bullying and harassment.
 - Follow procedures for reporting bullying and harassment.
- f) Review policy annually.
- g) Do not engage in bullying and harassment of workers and supervisors.
- h) Comply with policy and procedures.

<https://www.worksafebc.com/en/health-safety/hazards-exposures/bullying-harassment/resource-tool-kit>

Emergency Preparedness

Emergencies and disasters can occur any time without warning. The more you are prepared for them, the better you will be able to act, minimizing panic and confusion when an emergency occurs.

Section 4.13 of the *OHS Regulation* ("Regulation") states:

- (1) The employer must conduct a risk assessment in any workplace in which a need to rescue or evacuate workers may arise.
- (2) If the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures must be developed and implemented, and a worker assigned to coordinate their implementation.

Start by asking these basic questions:

- How well prepared is your business now?
- What procedures do you already have in place for an emergency situation?
- What potential emergency situations could occur?

Suggested guidelines for preparing for an emergency response:

- Determine the conditions under which an evacuation would be necessary.
- Designate primary and secondary evacuation routes and emergency exits. Make sure they are clearly marked and well lit.
- Post signs and install emergency lighting in case a power outage occurs during an evacuation.
- Ensure that evacuation routes and emergency exits are:
 - Wide enough to accommodate the number of evacuating people.
 - Clear and unobstructed at all times.
- Designate “evacuation wardens” who will help others during an evacuation and account for employees.
- Develop a system for accounting for evacuated employees.
- Hold emergency drills at least once a year to ensure that employees know what to do in an emergency and to test the effectiveness of emergency exit routes and procedures. Keep records of such drills.
- Consider the transportation needs of employees.
- Post evacuation procedures where employees can read them.
- Establish procedures for assisting people with disabilities and people who do not speak English.
- Consider how you would access important personal information about employees in an emergency (for example, contact numbers for their home, next-of-kin, and medical care).

Part IX

This section includes information on the following:

- Appendices
- Personal Protective Equipment
- Training Providers
- Toolbox Meetings

Appendices

Workers Compensation Act, Part 3—Occupational Health and Safety

www.WorkSafeBC.com

- Division 4—Committee/Worker Safety Reps
- Division 10—Incident investigation and reporting
- Division 11—Inspection, investigation and reporting
- Division 12—Enforcement
- Division 15—Offences

Occupational Health & Safety Regulation

www.WorkSafeBC.com

- Part 3—Rights and Responsibilities
- Part 4—General Conditions
- Part 5—Chemical and Biological agents (WHMIS)
- Part 8—PPE Personal Protective Equipment
- Part 10—De-energize/lock-out
- Part 11—Fall Protection
- Part 12—Tools, machinery, and equipment
- Part 14—Cranes and Hoists
- Part 15—Rigging
- Part 16—Mobile Equipment
- Part 18—Traffic Control
- Part 19—Electrical Safety]
- Part 20—Construction, Excavation, and Demolition
- Part 24—Diving, Fishing, and Other Marine Operations

BC Traffic Control Manual 2015

Visit http://www.th.gov.bc.ca/publications/eng_publications/tcm/traffic_control_manual.html

ARA Healthy and Safety Resources

Visit <http://www.ara.bc.ca/about-education-training/ara-health-safety>

Personal Protective Equipment

Employer Responsibilities:

Employers are responsible for providing and enforcing the use of personal protection equipment. This may include; fall, respiratory, eye and hearing protection or any other type of specialized protective equipment.

Worker Responsibilities:

Workers must equip themselves with suitable clothing, shirts, and long pants (unless otherwise provided by the employer) for protection, both against the weather and workplace hazards. Workers are also responsible for providing safety foot wear and gloves (unless otherwise provided by the employer).

Where there is a danger of making contact with moving parts, machinery, equipment, or tools:

- Avoid loose fitting or frayed clothing.
- Remove accessories such as rings, jewelry, or watch bands.
- Confine long hair.
- Wear a short sleeve shirt and leg pants.

High Visibility Garments for Roadside Assistance



Safety Vests are a requirement of WorkSafeBC and the Ministry of Transportation for the purpose of identifying a worker's location or well-being. The apparel must be of a colour which contrasts with the environment. Reflective arm and leg bands are highly recommended for work at night as the motorist detects movements of the legs and arms from a greater distance.

A worker exposed to the hazards of vehicles travelling at speeds in excess of 30 km/h (20 mph) must wear high visibility apparel meeting the Type 1 or Type 2 criteria of WCB Standard Personal Protective Equipment Standard 2-1997, High Visibility Garment.

A worker whose duties on the work site result in exposure to the hazards of mobile equipment must wear high visibility apparel meeting at least the Type 3 criteria of WCB Standard Personal Protective Equipment Standard 2-1997, High Visibility Garment.

Safety Footwear

Foot wear must protect the worker's ankles, soles and toes.



Use safety footwear with a CSA green triangle



Eye Protection

Loss of an eye can change your life forever. Even injuries that may seem minor can turn serious if not treated properly. WorkSafeBC Regulations 8.14 Eye protection: (2) A worker must wear eye protection if the worker is in an area of the workplace where one or more hazards involving the eyes exist, or are created, due to conditions or activities conducted in the area.



Respiratory Protection

Some tasks in automotive repair shops produce airborne materials that can damage the lungs if inhaled.

The employer must supply, and ensure that workers within a designated work area wear, respirators which are adequate for the anticipated level of exposure.



<https://www.worksafebc.com/en/health-safety/tools-machinery-equipment/personal-protective-equipment-ppe/types/respiratory-protection>

Hearing Protection

Hearing protection is a WorkSafeBC requirement. WorkSafeBC regulations 7.7 states that If it is not practicable to reduce noise levels to or below noise exposure limits, then the employer must:

- a) Reduce noise exposure to the lowest level practicable.
- b) Post warning signs in the noise hazard areas.
- c) Give to affected workers hearing protection that meets the requirements of CSA Standard Z94.2-02, Hearing Protection Devices—Performance, Selection, Care, and Use. Workers in a posted noise hazard area must wear hearing protection.

The following factors must be considered when deciding which hearing protection is adequate:

- Daily noise exposure;
- Hearing ability;
- Communication demands; and,
- Use of other personal protective equipment.



Training

As discussed earlier, employers have a legal duty to provide their workers with the information, instruction, training, and supervision necessary to ensure their health and safety—and the health and safety of other workers—when carrying out their work.

Training includes providing safety orientation for new and young workers and training workers on their specific tasks. This includes:

- Ensuring workers have a safety orientation and basic training before they start working.
- Training workers for tasks specific to their jobs.
- Providing ongoing supervision and training for workers.

Job-specific training is required. Examples of third-party safety training available for the Auto Repair industry include the following:

- WHMIS;
- TDG;
- Toolbox Meetings;
- In-house Company Training Program;
- OHS basics for safety representatives and Occupational Health and safety committee members;
- Supervisor OHS responsibilities;
- Incident investigation;
- First Aid Training;
- Prevention of Violence in the workplace;
- Workplace Bullying and Harassment; and,
- Emergency Preparedness.

Toolbox Meetings

Protection from Contact Pressure

In Cab Work

MSI Prevention

Overhead Work

Stock Handling and Storage

Tire Handling

Under Hood Work

Unplanned Events

Protection from Contact Pressure—MSI Prevention—Personal Protection

Objectives:

1. Understand why contact pressure presents risk.
2. Promote safe work behaviour and use of pads.

MSI Hazards and Work in the Cab:

- Sustained awkward postures: bending forward and leaning into the cab or across seats.
- Sustained awkward postures: limited space restricts postures.
- Sustained awkward postures: poor lighting results in awkward posture for visual access.

Set up the Work Control Posture—Provide Space and Light

Preventing MSI—Set Up the Work



Use a hoist that allows the doors to fully open. Position vehicle height to provide good physical and visual access.



Adjust seat position backward to provide as much space as possible and to improve access within the cab.



Use a task light to illuminate what needs to be seen in dark areas beneath or behind the dash.

Take Charge of Your MSI Risk Safety before Speed—Work Smartly “Pain is Optional”

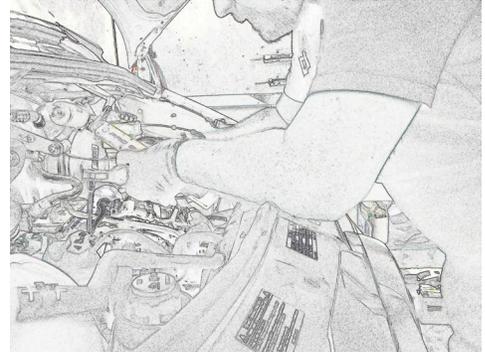
In Cab Work—Musculoskeletal Injury (MSI) Prevention

Objectives:

1. Understand MSI risk when working inside the cab.
2. Promote safe work behaviour when working in the cab.

MSI Hazards and Work in the Cab:

- Sustained awkward postures: bending forward and leaning into the cab or across seats.
- Sustained awkward postures: limited space restricts postures.
- Sustained awkward postures: poor lighting results in awkward posture for visual access.



Why is Contact Pressure an MSI Risk?

- Contact pressure blocks blood flow, nerve function, and movement of tendons or muscles.
- Redness, skin creasing, bruising or callous formation are signs of contact pressure.
- Contact pressure contributes to risk of nerve and tendon injuries.

When does Contact Pressure Happen?

- Leaning into the engine compartment and supporting your weight on a forearm or elbow.
- Kneeling on the ground to place the hoist beneath a vehicle.
- Pushing, pulling or gripping objects that have square edges, such as pushing the hoist beneath a vehicle.

Leaning on a hard edge—place a pad.
Kneeling on the ground—place a pad.

Personal Protection:

- Place padding between you and the pressure point.
- Keep kneeling pads or foam leaning pads in each bay so they are readily available.
- Use kneeling pads to protect knees when setting the lift beneath a vehicle.



Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”

MSI Prevention—Know the Signs—Take Charge Early

Objectives:

1. Recognize MSI signs, symptoms and hazards.
2. Know what to do if you have MSI signs or symptoms.
3. Promote safe work behaviours.

Musculoskeletal Injury (MSI):

- **MSI** are soft tissue injuries (e.g., muscles, tendons, ligaments, nerves, joints) that may be **caused** or **aggravated** by work.
- **Traumatic MSI**—caused by a single event or accident (e.g., strains, sprains, slips, falls).
- **Repetitive MSI**—develop slowly over time (e.g., tendonitis, low back pain).



Early Signs of MSI:

- Symptoms may include pain, numbness, tingling, weakness, swelling, or difficulty moving.
- May appear suddenly or gradually; at or away from work (even during sleep).

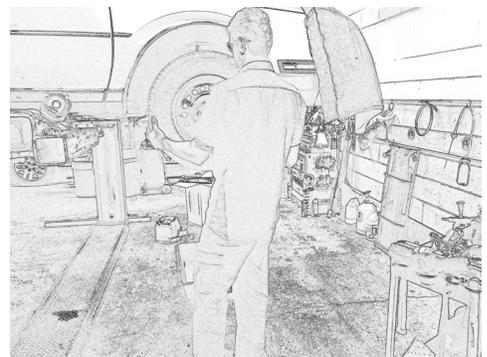
What to Do if you notice Early Signs of MSI?

- Don't ignore it! Early response to early symptoms is effective.
- Pay attention to what makes it worse and **work differently** to relieve symptoms.
- Inform your supervisor and/or first aid.

**Catch MSI Symptoms Early
Change How You Work to Prevent Severe Injury**

Key Hazards for MSI—Look for These in Your Work

- **Force** = lifting, pushing, pulling, carrying, holding, gripping.
- **Awkward posture** = reaching, bending, twisting.
- **Repetition** = how often (force and/or posture).
- **Sustained** = for how long without rest (neutral posture, no force).
- **Vibration** = powered or pneumatic hand tools.
- **Contact pressure** = leaning on or gripping edges.
- **Unaccustomed** = not typical work or new employees.



Preventing MSI—Safe Work Strategies to Control MSI Hazards

- **Set up work** for the best posture and position of strength.
- **Use the right tool** for the job.
- **Use the best technique** for the job—how you move matters.
- **Protect your body**—PPE-kneeling pads, leaning pads, gloves.
- **Be informed**—know best practices and how to work safely.

Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”

Overhead Work with Hoists—Musculoskeletal Injury (MSI) Prevention

Objectives:

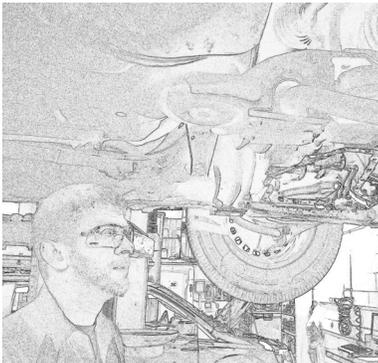
1. Understand MSI risk when working overhead with a hoist.
2. Promote safe work behaviour when working overhead.

MSI Hazards and Overhead Work

- Sustained awkward posture: Reaching and looking upward.
- Sustained force with awkward posture: Holding parts in place while removing or installing.
- Tripping on floor-level obstacles while looking up.

Set it Up to Minimize Risk Everything in its Place

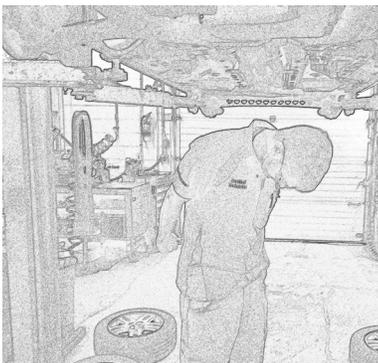
Preventing MSI—Set it Up



Adjust hoist height to provide minimal head clearance. If working in a designated bay, mark the hoist to make the initial height adjustment easier.



Stabilize or hold parts using screw jacks rather than manually. This keeps both hands free and reduces the amount of time with hands above head.



“Offload stretch”. Provide recovery from working overhead by periodically moving in the opposite direction—look down and stretch arms backward.



Standardize a tire location and keep the floor clear. The technician will be looking up—remove floor level trip hazards.

Take Charge of Your MSI Risk Safety before Speed—Work Smartly “Pain is Optional”

Stock Handling and Storage—Musculoskeletal Injury (MSI) Prevention

Objectives:

1. Understand MSI risk when handling stored stock (parts, fluids).
2. Promote safe work behaviour when handling stock.
3. Promote safe planning in the storage of stock.

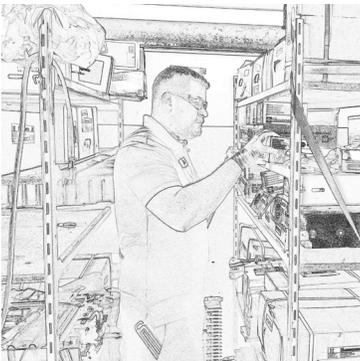
MSI Hazards and Stock Handling:

- Anything in storage will be lifted to put it there and lifted again to remove it for use.
- Force: The heavier the object the higher the risk.
- Awkward posture: Height and location of storage defines lifting postures.
- Awkward posture: Reach above shoulders or below knees increase risk when lifting.
- Awkward posture: Obstacles or cluttered spaces define lifting postures and carrying hazards.

Plan Storage to Support Safe Stock Handling Everything in its Place—Clear Path

Preventing MSI—Plan Storage for Safe Handling:

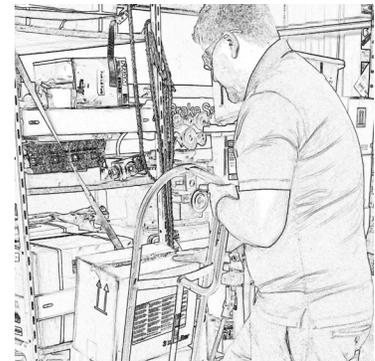
- Use a lift assist for heavy items.
- Use good body mechanics—get close to the load; lift from a position of strength.
- Maintain a clear path.
- Select appropriate storage locations based on size and weight of the item.



Smaller, lighter items between chest and head height.



Heavier items between mid-thigh and mid-chest level to prevent awkward postures when lifting.



Large or heavy items at floor level to be moved using a hand truck will eliminate the need to lift.

**Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”**

Tire Handling and Musculoskeletal Injury (MSI) Prevention

Objectives:

1. Understand MSI risk when handling tires.
2. Promote safe tire handling technique.

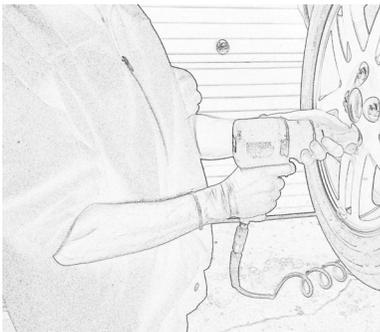
Risk?

“Tires” are associated with 45% of WorkSafeBC MSI Claims by automotive technicians and mechanics. How you work matters.

MSI Hazards and Tires:

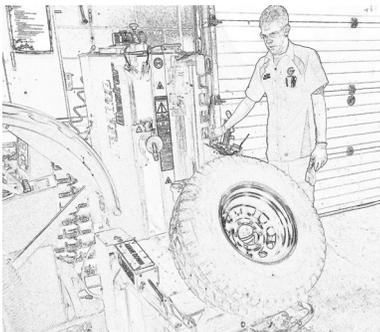
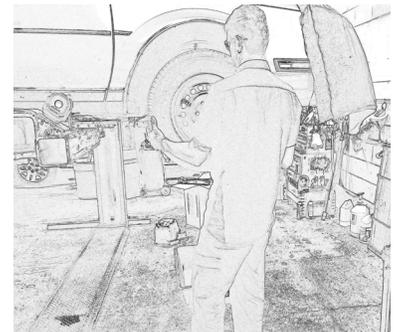
- Force: tires on rim require 20lb (small car) to 100lb + (truck) lift.
- Force: removing and installing tire lug nuts requires 80 to 180 ft-lb torque.
- Awkward posture with force: lift tires—on/off vehicle on hoist or on/off tire changer.
- Awkward posture with force: torque check lug nuts at ground level.
- Repetition: four tires per vehicle x five lug nuts per tire x on/off each tire x vehicles per day.

Preventing MSI: Working Smartly—Be Informed About Best Practices



Set up work for best posture and strength:

- Set hoist height to align the wheel hub with elbow height for lifting and for tool use.
- Mark your preferred height on the hoist.



Use the right tool for the job:

- Tire lifters and lift assists eliminate the lift on tire changers or balancers.



Use the best technique for torque checks:

- Stagger feet;
- Bend knees;
- Push pelvis back;
- Smooth push down.

**Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”**

Under Hood Work—Musculoskeletal Injury (MSI) Prevention

Objectives:

1. Understand MSI risk when working under the hood.
2. Promote safe work behaviour when working under the hood.

MSI Hazards and Under Hood Work:

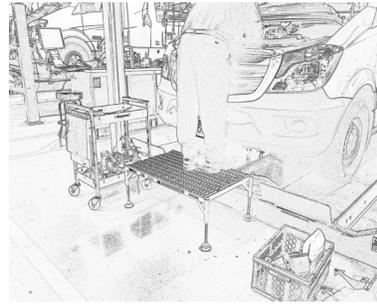
- Sustained awkward postures: bending forward and looking down to reach into the engine compartment. involves awkward back, shoulder and neck postures.
- Contact pressure: leaning on or across edges.
- Repetition: reaching for tools or parts.

Set up the Work Lean on a Pad

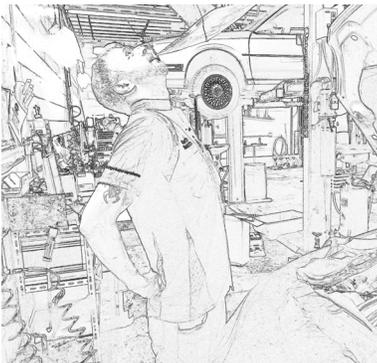
Preventing MSI—Set Up the Work



Topside creepers elevate the technician and give a padded surface to lean on.



Steps with a large standing surface improve shoulder posture when working on taller vehicles.



“Offload stretch”. Recover from leaning forward by stretching in the opposite direction—look up and push pelvis forward.



Foam leaning pads eliminating contact pressure on the forearm and support some upper body weight when leaning forward.

**Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”**

Unplanned Events—Musculoskeletal Injury (MSI) Prevention

Objectives:

1. Understand when and where falling or dropped items present MSI risk.
2. Promote safe work behaviour.

MSI Hazards and Unplanned Events

- Items that fall or that are accidentally dropped are unplanned events.
- Force with awkward posture: Rapid, forceful movements when attempting to catch a falling item.
- Struck by: Items that fall from above, such as from a raised vehicle, may land on the technician.

Set it Up to Eliminate Risk of Items Falling on You If it Falls—Step Clear and Let it Land



We all drop things.
Step clear and let falling items fall.
Clean up is faster than injury rehabilitation.
Avoid the reflex to catch a falling item.



Remove all tools and loose parts from the engine compartment before raising a vehicle on a hoist.

- Place loose parts and tools within the engine compartment on a rag or tray to make them easy to see.
- Better yet, place loose parts and tools on a cart or tool tray beside the vehicle.

**Take Charge of Your MSI Risk
Safety before Speed—Work Smartly
“Pain is Optional”**
